THE IRON TRADE REVIEW

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GREAT PROSPERITY

FOR MANY MONTHS NOW SEEMS CERTAIN

If Prices Are Not Rapidly Advanced. —Immense Activity in Pig Iron and Quotations Higher.

All indications point to great prosperity during the remaining months of the present year, and at least the early months of 1907. Although the production of pig iron for the year ending July 1, 1906, was 24,432,106 tons, nearly 1,500,000 tons more than the entire calendar year 1905, the production has not kept pace with the demand and there is now a marked scarcity of all grades. Seven new blast furnaces, having an annual capacity of 880,000 tons, have been blown in this year, and others will be in operation at not far distant dates, but if the present demand continues, it is doubtful whether even this added capacity will be sufficient. Prices are advancing more rapidly toward those of the boom period of 1902 than conservative interests like to see, and in this tendency lies the only danger which now threatens a long continuance of prosperity. Rumors have been current that prices of iron ore are to be advanced 50 cents per ton, but there is no authority for such announcement. Ore merchants deplore any tendency to force the buying of ore before next winter, and some of them at least are decidedly opposed to more than a 25-cent advance. A car famine is threatened. Prominent railroad men admit that, in spite of the immense purchases of equipment during the past twelve months, the railroads will not be in much better condition than they were last year to handle the crops, which will be very large.

Pig Iron Very Active. There has been great activity in pig iron, especially in the west, and a prominent feature has been the inquiry for the future, some of it extending through the first half of 1907. In the east the large sales have been confined to basic which have aggregated about 125,000 tons, cleaning up about all of that grade available for this year's delivery. In Chicago about 100,000 tons, including all grades, have been sold, and the demand has not been satisfied. One selling agent in that city has disposed of the output of the furnaces which it represents for the first two months of 1907. The Bessemer Pig Iron Association has no more iron for sale this year, and other makers of Bessemer and basic are in nearly the same condition. In the central west inquiries are now pending for 100,000 tons of basic for the first quarter of next year, and the ruling quotation is $17.50, while the quotation on Bessemer for that period is $17.75 at the furnace. To Cleveland, Toledo and other cities in which furnaces are located, iron is being shipped long distances, and some fancy prices are being paid. Among the notable transactions of the week were 15,000 tons of Bessemer sold at $18 valley. A number of the leading producers in the south are out of the market, and $14 for No. 2 Birmingham is the ruling price with a limited supply on hand. Even in the Ironton district where quotations are usually lower than those in the Mahoning and Shenango valleys, $17.50 for No. 2 foundry for 1907 delivery is being named.

Bar Iron Advanced. Although interest has centered in pig iron during the past week, there has been continued activity in the finishing mills, and specifications are being received in even greater volume than during July. It is now expected that there will be a general advance in finished material in sympathy with pig iron prices, but the principal producer of bar iron has advanced the price $2; and one large independent interest has advanced the price of steel bars the same amount, but it is not anticipated that other makers of steel bars will do likewise. The demand for both iron and steel bars is strong.

Many Car Inquiries. The sheet market is in excellent condition. Sheet bars are, however, very scarce and mills are from ten to twelve weeks behind in deliveries. Specifications on tin plate are increasing, but new business is not large. New business recently booked by plate mills has been very heavy, and inquiries are now pending for 20,000 cars which will require a large tonnage of plates. A very large tonnage of merchant pipe has recently been sold, and although some low prices have been made, business is now in excellent condition.

Scrap is Stronger. The improvement in old material noted last week is more pronounced, the demand having increased while prices are advancing. The coke market continues firm with production hardly equal to the demand.

Protection for Trains. Many inquiries for heavy tonnages of steel rails are pending. The actual transactions of the week have not been numerous. The Tennessee Coal, Iron & Railroad Co. has sold its entire tonnage of open-hearth rails for 1907 delivery. The demand for track supplies is strong, especially for spikes, owing in part to the double spiking of tracks which has been inaugurated by leading railroads in order to secure extraordinary protection for fast trains.

New Soo Record.—More freight was carried through the Soo ship canals in July than in any previous month in their history. In figures July tonnage was 7,732,771, a gain over the corresponding month in 1905 of 1,029,011 tons. If the present rate is maintained for the balance of the season the tonnage for this year will reach 50,000,000. Freight movement to date this season is 22,610,551 tons, compared with 19,837,000 tons for the same period last year.

THE WEEK IN IRON CENTERS.

PITTSBURG.

Pig Iron Advancing and Supply Limited.—Finished Material Active.

Office of THE IRON TRADE REVIEW. }
521 PARK BUILDING, AUG. 7 }

The extreme strength of the pig iron market, together with the scarcity of all grades, combined with the disposition of consumers to buy as far ahead as producers are inclined to accept business, has been the leading feature of the market during the week under review. Business in the finished lines has been very strong and large tonnages have been placed, but this branch of the market has in a way been overshadowed by the intensity of the situation regarding pig iron. The marked scarcity which developed shortly before the beginning of the third quarter is not confined to any particular grade, but the stringency of the supply is felt mostly by consumers of Bessemer and foundry iron. This condition has materially improved the scrap market, which has been lagging ever since the beginning of the year, and larger tonnages of old material have been moving during the past two weeks, with the result that scrap prices have advances on an average of fifty cents per ton and a considerable amount has been sold at the advance.

Pig iron, however, is not the only branch of the trade in which the scarcity of supply is becoming greater every week. It has been almost impossible to get small billets or sheet bars and there has been practically no open-hearth semi-finished steel in the market for several weeks past. The finishing mills of billet producers have so much actual business on their books that they cannot give up any of their semi-finished material for outside consumption and instead of showing an improvement in the way of better supply the situation is becoming more strained.

The market for merchant pipe is in excellent condition as far as tonnage is concerned, the inquiry being much better than it has been for some time past, but prices remain the same. There has been an immense amount of business booked by the pipe mills and demand for deliveries has been strong, indicating new projects that are being pushed along toward completion. There are several inquiries for line pipe running into good tonnages, but the major part of the business in this department has been on comparatively short mileages, although the aggregate has developed a good business.

The leading producer of iron bars has advanced the price $2 per ton for eastern or western shipment and $1 per ton for Pittsburg consumption, and during the week sold about 20,000 tons, not much of which, however, was at the advance. The market on steel bars is very strong and while the leading interest is covered pretty well to capacity as far ahead as the end of the contract year, other producers are in shape to make fairly quick deliveries. Some premium business has been offered for quick deliveries, but the leading producers are not inclined to accept this class of business and it has been refused with one or two exceptions.

Finishing mills have as yet shown no disposition to advance the price on their products in line with the advancing price of pig iron.

Pig Iron.—Pig iron is the most active feature in the market and is likely to remain so for some time to come on account of the growing scarcity, which is becoming more pronounced from week to week, and while prices have advanced steadily for the past three weeks, still higher prices are predicted. There is practically no northern No. 2 foundry iron to be had for spot shipment and Bessemer iron is rapidly nearing the same condition. During the past week one lot of Bessemer iron, 15,000 tons, was sold to a Chicago consumer on a basis of $18, valley furnaces for delivery from August to October. Another lot of 2,000 tons was sold at $18, valley for September delivery and 3,000 tons in small lots for August and September delivery was sold at $18.25, valley. The number of valley furnaces now out that have been running on Bessemer iron has something to do with the situation, and while their resumption may prevent a runaway market, the increase will not be sufficient to meet the demand at the present rate of consumption. The steel corporation has not figured to any great extent in the pig iron market for some time. Four of its furnaces, Carrie No. 4, Donora No. 1, Ohio No. 4 and South Sharon No. 1, are out of blast for relining and repairs and Edgar Thomson No. B and Bellaire No. 1, that have been out, are ready to resume operations. The feeling of consumers of both Bessemer and foundry iron is clearly indicated by their inquiries for requirements into next year, considerable business having already been done for delivery through the first three months of 1907 and some has been done for the first half of next year, these consumers not caring to take chances on a continued scarcity running into next year. This is particularly true of consumers of foundry iron. We quote Bessemer iron $18 to $18.25 and basic $17.25 to $17.50, valley. Northern foundry is quoted $17.50 to $17.75 and northern forge $16.50, valley. Southern foundry No. 2 is quoted $14 to $14.25, Birmingham, and southern forge iron $12.25 to $12.50, Birmingham. On the inquiries for very forward delivery, first quarter of next year, furnaces are quoting current prices. We quote:

Bessemer Valley	18.00 to 18.25
Bessemer, Pittsburg	18.85 to 19.10
No. 1 Foundry, Pittsburg	18.60 to 19.10
No. 2 Foundry, Pittsburg	18.35 to 18.60
Gray Forge, Pittsburg	17.10 to 17.35
Basic, Valley	17.25 to 17.50
Basic, Pittsburg	18.10 to 18.35

Ferro - Manganese.—The Russian situation has made ferro-manganese an uncertain quantity and importers are endeavoring to get as much shipped from abroad as they possibly can to meet emergencies, should it become impossible to secure Rusian ores for English makers of ferro-manganese. On foreign 80 per cent we quote $90 for October foreign shipment. During the past two weeks some ferro-manganese has been sold at $85, Pittsburg.

Steel.—The continued scarcity of semi-finished steel is getting to be an old story, but the situation has not improved a bit and, if anything, the scarcity is more pronounced than it has been during the past few months. There is practically no open-hearth steel to be had and only occasional small lots of Bessemer billets are obtainable. Sheet bars, which are nominally quoted $29, Pittsburg, are extremely scarce and the largest producers are entirely out of the market on new business and are having difficulty in keeping abreast of contract deliveries, on account of the keen demand of their own finishing mills for the steel in other forms. We quote nominally $27.50 on Bessemer billets and $28.50 on open hearth and $29 on sheet bars.

Skelp.—With the low pipe prices which are prevailing and the steady strength of semi-finished material, there have been but very few skelp plate transactions and at least one pipe mill of fairly large proportions has discontinued the production of the small sizes of pipe, viz., under three inches, on account of the narrow margin left for the

finished pipe. There are now very few makers of iron pipe in this district so that iron skelp is moving very slowly. On narrow widths and light gauges we quote:

Bessemer grooved, 1.57½c to 1.60c; sheared, 1.65c to 1.70c; basic grooved, 1.60c to 1.65c; sheared, 1.65c to 1.70c; iron skelp, grooved, 1.70c to 1.75c; sheared, 1.80c to 1.85c.

Muck Bar.—There has been practically no inquiry for muck bar and with the price of forge iron at this time, we quote a nominal market of $30 on all pig metal muck bar.

Hoops and Bands.—This is the dull period of the year and the new business being booked is light. The annual meeting of the National Cooperage Association will be held in Chicago August 14-15-16 and it is more than likely that the year's buying will form one of the topics to come up for consideration. We quote:

Hoops, 1.90c in carload lots, and 2c on less than carload lots, bands, 1.50c base, half extras as per standard steel card. Prices f. o. b. Pittsburg.

Structural Material.—The amount of new business being received in small lots is surprising at this time. There has been nothing large in any one contract or in any particular line, but the aggregate has been good and the specifications against existing contracts are very heavy. Construction companies have an immense amount of business on their books and have shown less of a tendency to exploit their new projects than formerly, both on account of labor troubles and a fear that publicity given to large contracts on hand would deter prospective new business. We quote:

Beams and channels, 15 in., and under, 1.70c; over 15 in., 1.80c; zees, 1.70c; tees, 1.75c; angles from three to six inches, inclusive, 1.70c; over six inches, 1.80c; universal and sheared plates, 6¼ inches and wider, 1.60c base.

Plates.—The lake shipyards, which have been the largest factors in this market during the past two months, have now closed for about all the material they will need until early next spring in the construction of new lake tonnage, and this, together with the urgent demand of the steel car companies for deliveries on their contracts, has comfortably filled up most of the mills for some time ahead. Other producers are in shape to make five-week deliveries and it has been reported that one or two mills have offered price inducements for business on certain sizes in which their order books are light. Inquiries are out for about 20,000 cars for next year. We quote:

Sheets.—Specifications continue to be in excess of shipments and the sheet market is in excellent condition, both the leading interest and independents having all the business they can handle and considerable business is being done by jobbers with consumers who have been unable to get prompt mill deliveries. The scarcity of sheet bars is a troublesome factor. We continue to quote:

Black steel sheets, box annealed, cold rolled, one pass: Nos. 11-12, 2.10c; Nos. 13-14, 2.15c; Nos. 15-16, 2.20c; Nos. 17-21, 2.25c; Nos. 22-24, 2.30c; Nos. 25-26, 2.35c; No. 27, 2.40c; No. 28, 2.50c; No. 29, 2.65c; No. 30, 2.75c. Galvanized, Nos. 10-11, 2.45c; Nos. 12-14, 2.55c; Nos. 15-16, 2.65c; Nos. 17-21, 2.80c; Nos. 22-24, 2.95c; Nos. 25-26, 3.15c; No. 27, 3.35c; No. 28, 3.55c; No. 29, 3.80c; No. 30, 4.05c. Corrugated roofing, $1.75 per square for No. 28 painted, 2½-inch corrugation; $3.10 per square for No. 28 galvanized, 2½-inch corrugation. Quotations f. o. b. Pittsburg on large lots.

Tin Plate.—With the closer approach of the canning season specifications have increased in proportion, although new business is comparatively light. As in the sheet market, the scarcity of semi-finished material is a serious handicap against full production. We quote:

$3.75 per base box, f. o. b. Pittsburg, 14 x 20 100 pound-cokes, terms 30 days, less two per cent off for cash in ten days.

Merchant Pipe.—An immense new tonnage has been placed with pipe mills in this and adjoining territory, and this extends to both merchant and line pipe sizes. Some very low prices have been made. The aggregate tonnage placed has been big, although individual contracts have not been anything out of the regular run. This demand, which has shown a marked improvement, is from all parts of the country. One producer in the Pittsburg district has shut down his butt-weld and will not make pipe three inches and under, giving as his reason the narrow margin existing between semi-finished material and the finished product. The discount to the large trade is 81 and 5 off and on pipe we quote the following official list, consumers' carloads, with jobbers' carloads one point higher:

	Steel		Iron	
Consumer's Carlonds	Black	Galv.	Black	Galv
⅛ and ¼ inch	71	55	67½	51½
⅜ inch	73	59	69½	55½
½ inch	75	63	71½	59½
⅝ to 6 inches	79	69	76	66
7 to 12 inches	74	59	71	55½
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch	64	52	60½	48½
½ to 4 inches	71	59	67½	56½
4½ to 8 inches	67	55	63½	51½
Double extra strong plain ends, ⅛ to 8 inches	60	49	56½	45½

Boiler Tubes.—There has been no decided change in the tube market. A good run of business is being accepted right along and prices remain unchanged as follows:

	Steel	Iron
1 to 1⅝ inches	50	45
1⅞ to 2¼ inches	62	45
2½ inches	64	50
2¾ to 5 inches	70	57
6 to 13 inches	62	45

Less than carload lots two points less.
2½ inches and smaller, over 18 feet, 10 per cent net extra.
2¾ inches and larger, over 22 feet, 10 per cent net extra.

Steel Bars.—Specifications against existing contracts during the week under review have been very heavy and aside from this, considerable new business has been placed. A $2 premium has been offered from some directions for prompt delivery, but this has been refused as a rule, although one or two producers have been accepting it for some time past. Prices are quoted as follows:

Cold rolled and ground shafting, 50 per cent off in carload lots, and 45 off in less than carloads, delivered in base territory; tire steel, 1.70c to 1.80c; open-hearth spring steel, 2.25c to 2.50c; sleigh shoe flat, 1.50c to 1.55c; smooth finished machinery steel, 1.90c to 2c; toe calk, 2.05c to 2.10c. The price of planished and machine straightened tire is 1.70c base half extras as below. Iron finished tire up to 1½ inch by ½ inch, 1.65c base half extra tire list. Iron finished tire up to 1½ inch by ½ inch and over to be sold on regular bar basis of 1.50c base, half extra steel card.

Merchant Bars.—The leading producer in this district has advanced the price of iron bars to 1.60c, base Pittsburg for both Pittsburg delivery and eastern or western shipment. This is an advance of $2 on outside shipments and $1 per ton on Pittsburg delivery. There has been a free movement in bar iron during the week and about 20,000 tons were sold, although but a small part of this tonnage went at the advanced price.

Rails and Track Material.—Inquiries amounting to upward of 100,000 tons of rails have been received by local mills during the week under review, and it is estimated that fully 75 per cent of this will result in actual business within a short time. The demand for both light and standard sections is very strong and on standard sections there is but very little open tonnage for the remainder of the present year. There are several very heavy inquiries out for next year delivery. Rerolling mills during the past few weeks have shaded light rail prices, but their efforts to secure the business have availed but little in the face of the demand. The spike situation is extremely strong and mills are filled until close to the first of the year. Some of this demand is caused by the action of one or two of the trunk lines double

spiking their main lines, as a precaution against accidents to their fast through limited trains. The Lake Shore has taken the initiative in this direction. There is an increasing demand for steel ties and several orders for experimental purposes have been placed. We quote:

Fifty pounds and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails, 16 pounds, $30; 20 pounds, $29; 25 to 45 pounds, $29; angle bars for standard sections, 1.50c; spikes, $2.05 to $2.10.

Wire and Wire Nails.—The market for wire products is in better shape at the present time than it has been at a similar period of the year for many years and prospects for a continuation of this condition are excellent. There has been no change in prices and we quote:

Wire nails, jobbers' carload lots, $1.85; retailers' carload lots, $1.90, and less than carload lots, $2; painted barb wire, $2 for jobbers in carloads; retailers in carloads, $2.05, and less than carloads, $2.15, with 30c for galvanizing, plain wire, $1.70 to jobbers and $1.75 by carload.

Old Material.—In sympathy with the advancing prices in pig iron the scrap market has shown a tendency to advance and sales of heavy melting stock were made during the week at from $16.25 to $16.50, or from 25 to 50 cents better than the quotations of the previous week. The Steel Corporation bought some heavy melting stock during the week. Holders of the more desirable lines of old material are not inclined to sell at this time, preferring to wait for better prices which they expect.

Heavy melting stock, $16.25 to $16.50; No. 1 cast scrap, $15.50 to $16; cast borings, $8.50 to $9; bundled sheet scrap, $14; malleable scrap, $15.50; No. 1 railroad wrought, $17; low phosphorus scrap, $18.50 to $18.75; wrought turnings, $11.50 to $11.75; busheling scrap, $14 to $14.50; iron axles, $26 to $27; old rails, rerollers, $17.50.

Coke.—The coke market which has been strong all summer, has developed additional strength. Furnace coke is in very strong demand and the supply is limited despite the fact that several furnaces are now out and will be out for 30 or 60 days for relining and repairs and also that several new operations are now in blast and others are about to start in the Connellsville region. We quote furnace coke $2.70 to $2.80, ovens, and foundry coke $3 to $3.15, ovens. A new furnace interest is in the market for 15,000 tons to be used between this time and the starting of its own coke plant. The estimated production of the Connellsville region for the week ending July 28, was 272,914 tons and for the lower Connellsville region 104,324 tons.

CHICAGO.

Great Activity in Pig Iron.—Price of Bar Iron Is Advanced.

Office of THE IRON TRADE REVIEW, 1562 Monadnock Block, Aug. 7

The center of interest is unmistakably transferred this past week from steel to pig iron, not that steel has become dull, but because iron has become acutely active in this market. Old pig iron men lament what they say looks like a runaway market. They deprecate its appearance for the best permanent interest of the trade. While its arrival is by no means assured, the recent developments point strongly in that direction. One after another the southern makers have withdrawn from the market. Only a feebly small tonnage remains that is quotable and average prices are perhaps 25 to 50 cents above those of a week ago. Solely because the southern products are not procurable, trading has been relatively small, but local and neighboring northern furnacemen have viewed with greater freedom the remote chances of trade and have been loading up heavily with contracts for next year's shipments that have been held out to them by anxious buyers. After a more or less careful scrutiny of conditions, as they relate to pig iron, heavy melters in this market have reached the decision to buy largely into next year and the net results are enormous accessions to the order books of the furnaces.

Iron bars were advanced $2 per ton Monday morning by the Republic Iron & Steel Co., or to the basis of 1.60c, Pittsburg. Trade for the past week has been active. There is talk of an early advance of $2 in sheets, but the stories lack confirmation. In steel products generally there is not the same buoyancy as in pig iron nor the same present activity, but intrinsically the markets show no measure of depreciation from the recent reports of immense volume. There is good buying in most lines and specifications continue at record-breaking tonnages. Old material is both higher and livelier this week. Coke has developed strength and some heavy contracts have lately been closed.

Pig Iron.—The largest pig iron buying of the current year to date has occurred in this market during the past week. The amount bought has exceeded 100,000 tons and would have been greater were it not that many of the southern furnaces are out of the market. The business has therefore been confined mainly to northern furnaces. It has been general in character, embracing all grades, and the heaviest tonnage closed was for delivery during the first half of 1907. One of the largest sellers of northern iron here has placed orders for 1907 shipments, equivalent to two months' output of the furnaces represented. Other sellers have done correspondingly well. The buying has been mainly by the larger melters with a fair sprinkling of orders from the medium and smaller foundrymen also. There would have been also a large buying movement in southern irons but for the fact that most if not all the sellers from the south decline to entertain propositions affecting their next year's output. In fact it has been difficult to buy southern iron for any kind of delivery, near-by or remote. In addition to this extensive trading in iron for 1907 shipments, the inquiry for spot iron has been very heavy. There is practically no iron to be had and the needy inquirers shop around from one seller to another, often without avail. Prices are apparently in a transition stage and there is no recognized basis today. It is doubtful if any southern product can be picked up under $14.00, Birmingham, or $17.90, Chicago. A southern interest supposed to be the possessor of some tonnage has been turning down business at $14.25, Birmingham, and $14.50 is the usual quotation today. The largest producer in Virginia has advanced quotations to $17 furnace, equivalent to $19.85, Chicago. Northern irons are higher, but there is variance of quotation. Some sellers have been placing contracts for 1907 shipments at practically what has been the open market for some time, or about $18.50, Chicago. Others are quoting $19 as a minimum. Coke men have become interested in next year's trade and prices for furnace coke are higher. The large purchases of iron this past week include malleable, foundry and special grades. A recent purchase of 15,000 tons of eastern Bessemer by the International Harvester company mill at South Chicago followed the banking of one of its furnaces, but repairs have since been made. Quotations follow:

Lake Superior charcoal	$19.25 to 19.75
Northern Foundry No. 1	19.00 to 19.50
Northern Foundry No. 2	18.50 to 19.00
Northern Foundry No. 3	18.00 to 18.50
Northern Scotch Foundry	18.75 to 19.25
Ohio Strong Softeners No. 1	18.80
Ohio Strong Softeners No. 2	18.30
Southern Foundry No. 1	18.40 to 18.90
Southern Foundry No. 2	17.90 to 18.40
Southern Foundry No. 3	17.40 to 17.90
Southern Foundry No. 4	16.90 to 17.40
Southern No. 1 Soft	18.40 to 18.90
Southern No. 2 Soft	17.90 to 18.40
Southern Gray Forge	16.15 to 16.65
Southern Mottled	15.90 to 16.40
Southern Silveries (4 percent to 6 percent Silicon)	17.90 to 18.40

Jackson Co. Silveries, 8 to 10 percent Silicon =	23.30
Alabama and Georgia Car Wheel-	24.40 to 24.90
Malleable Bessemer	18.50 to 18.80
Standard Bessemer	19.30
Basic Iron	18.85

Billets.—Crude steel is as difficult to procure as it has been at any time in several months and prices are maintained at previous levels. Forging billets sell at $35 Chicago; wire rods, $36 Chicago, and sheet bars, $29 Pittsburg.

Iron and Steel Bars.—The advance of $2 per ton in the price of iron bars early this week by the largest producer came as a surprise to the trade. Business for the past week showed considerable activity. The new quotations place iron bars at a premium of $2 above steel. New contracts for the latter have been few, for most of the large business has been closed. Specifications are running along at a good gait, fully equaling production, which is held to be a good record for midsummer. Mill prices, Chicago delivery, are as follows:

Bar iron, 1.76½c; soft steel bars and bands, 1.66½c, half extras; soft steel angles, less than 3 x 3, 1.76½c; hoops, 2.06½c base, full extras; old rail stock, 1.65½c. Jobbers report a good demand from stock, with prices firm. We quote bar iron, 2.20c, full extras; soft steel rounds and squares, 3 inches and larger, $2 per 100 pounds base; flats, 2 inches to 4 inches by 1⅛ inch and larger, $2 per 100 pounds base; flats, 2 inches to 4 inches by 1⅛ inch and larger, $2 per 100 pounds base; flats, 4½ inches x 5 inches and 6 inches x 5-16 inch and thicker, $2 per 100 pounds base; all ovals, half rounds, $2 per 100 pounds base; steel bands, $1.85 to $1.95 half extras; soft steel hoops, $2.30 to $2.40 full extras. Other sizes not mentioned above, $1.85 per 100 pounds base, plus half extras.

Sheets.—Inquiries are reported numerous and mill capacity, with which to meet them, scant. There are many delays in filling orders. The tone of this market is strong. Mill quotations, Chicago delivery, are as follows:

Nos. 8, 9 and 10, 1.96½c; Nos. 11 and 12, 2.01½c; Nos. 13 and 14, 2.06½c; Nos. 15 and 16, 2.16½c; box annealed, Nos. 18 and 20, 2.36½c; Nos. 22 and 24, 2.46½c; No. 26, 2.51½c; No. 27, 2.56½c; No. 28, 2.66½c; No. 29, 2.81½c; No. 30, 2.91½c. Jobbers' prices on less than carload lots from store are as follows: No. 10, 2.20c; No. 12, 2.25c; No. 14, 2.30c; No. 16, 2.40c; Nos. 18 and 20, 2.65c; Nos. 22 and 24, 2.70c; No. 26, 2.75c; No. 27, 2.80c; No. 28 2.85c; No. 30, 3.30c.

Galvanized sheets, mill shipments, are as follows: Nos. 10 and 11, 2.56½c to 2.61½c; Nos. 17 and 21, 2.91½c to 2.96½c; Nos. 22 and 24, 3.06½c to 3.11½c; Nos. 25 and 26, 3.26½c to 3.31½c; No. 27, 3.46½c to 3.51½c; No. 28, 3.71½c to 3.76½c; No. 29, 3.91½c to 3.96½c; No. 30, 4.16½c to 4.21½c. From store, prices on less than carload lots are as follows: Nos. 10 to 20, 3.10c to 3.20c; Nos. 22 and 24, 3.25c to 3.35c; No. 26, 3.45c to 3.55c; No. 27, 3.65c to 3.75c; No. 28, 3.85c to 3.95c; No. 30, 5.05c to 5.15c.

Plates.—Specifications this past week have been large and some new business has been booked. Prices are strong, mill shipments, Chicago delivery, being quoted as follows:

Tank steel, ¼-inch and heavier, up to 100 inches wide, 1.76½c base; flange steel, 1.86½c base; marine steel, 1.96½c base; all full extras. Plates 3-16 inch thick, $2 extra; gauges, 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. We quote from local stocks: tank steel ¼ inch and heavier, up to 72 inches wide, 2c to 2.10c; 72 inches up to 96 inches wide, 2.10c to 2.20c; 3-16 inch up to and including 60 inches wide, 2.10c to 2.20c; 3-16 inch 72 inches wide, 2.35c to 2.45c; No. 8, up to 60 inches wide, 2.15c to 2.25c; flange steel, 25c extra; heads, 25c extra.

Wire Products.—There is dullness compared with the normally active seasons of the year, but for August the tonnage moving is considered excellent. Prices are unchanged, quotations to jobbers, mill shipment, for Chicago delivery being as follows:

Wire nails, $2; painted barbed wire, $2.15; galvanized barbed wire, $2.45; smooth annealed wire, $1.85; smooth galvanized wire, $2.15; polished staples, $2.15; galvanized staples, $2.40. Carload lots to retailers, 5 cents higher than above prices; less than carload lots, 15 cents higher.

Structural Steel.—The three street railway tunnels under the Chicago river, to be constructed this winter, will require over 1,000 tons of shapes. The contract for the Van Buren street tunnel steel, 400 tons, was closed last week and the other two will soon follow. There is in the market an inquiry for 1,200 tons for railway shops to be built in Kansas and inquiry of a miscellaneous character is excellent. Prospects are that one or two large Chicago office buildings, long in the market, will soon be contracted for. General specifications for structural material are heavy. Prices are without change, mill shipments, Chicago delivery, being quoted as follows:

Beams and channels, 3 to 15 inches, inclusive, 1.86½c; angles, 3 to 6 inches, 1.86½c; angles, larger than 6 inches, on one or both legs, 1.96½c; beams, larger than 15 inches, 1.96½c; zees, 3 inches and over, 1.86½c; tees, 3 inches and over, 1.91½c, with the usual extras for cutting to exact lengths, punching, coping, bending or other shop work.

Quotations on lots from store are as follows: All angles three inches and larger, including six inches, $2.25 per 100 pounds base; angles over six inches, $2.35 per 100 pounds base; tees, three inches and larger, $2.30 per 100 pounds base; beams, three inches to fifteen inches, inclusive, $2.25 per 100 pounds base; beams, eighteen inches and larger, $2.35 per 100 pounds base; channels, three inches and larger, $2.25 per 100 pounds base.

Rails and Track Supplies.—A new railroad enterprise in the southwest wants 20,000 tons of standard sections for delivery late this year. It is said to be doubtful if the deliveries desired can be made to fit mill engagements. A few scattering inquiries for 1907 shipments are current and they are being accepted by eastern mills. Prominent makers of light sections are sold well ahead and the inquiry continues large. There is continued brisk trading in angle bars, bolts and spikes for 1907 delivery. Quotations are as follows:

Standard sections, f. o. b. mill, open-hearth rails, $29; Bessemer, $28; light rails, Bessemer steel, 30 to 45-pound sections, $28.50; 25-pound, $29.50; 20-pound, $30.50; 16-pound, $31.50; 12-pound, $32.50, and lighter sections down to eight pounds, $29.50 to $41.50, all f. o. b. mill. Track supplies are quoted as follows. Angle bars, 1.50c to 1.75c; spikes (for quick shipment), 2.15c to 2.25c; for forward deliveries, 2c; track bolts (for quick shipment), 2.65c to 2.75c base; square nuts (for forward deliveries), 2.50c.

Merchant Steel.—It is indicative of the almost uninterrupted summer activities of western metal consuming plants, that the shipments of merchant steel into Chicago territory by one of the largest makers during last month were greater than for any preceding July in the history of the company. Specifications continue heavy and prices are firm at the following quotations, for mill shipment, Chicago delivery:

Planished or smooth finished tire steel, 1.86½c; iron finish, up to 1½ x ½ inch, 1.81½c; iron finish, 1½ x 1½ inch and larger, 1.66½c, base; channels for solid rubber tires, ¾ to 1 inch, 2.16½c, and 1⅛ inch and larger, 2.06½c; smooth finished machinery

steel, 1.91½c; flat sleigh shoe, 1.71½c; concave and convex sleigh shoe, 1.96½c; cutter shoe, 2.35c; toe calk steel, 2.21½c; railway spring, 1.86½c; crucible tool steel, 6½c to 8c, and still higher prices are asked on special grades. Shafting, 50 per cent off in car lots and 45 per cent in less than car lots, in base territory.

Boiler Tubes.—Trade continues of a most satisfactory volume with prices unchanged, as follows.

	Steel	Iron	Seamless
1 to 1¼ inches	46.35	43.35	53.35
1¼ to 2¼ inches	58.35	43.35	40.35
2¼ inches	60.35	48.35	43.35
2¾ to 5 inches	68.35	55.35	
2¾ to 4½ inches (Seamless)			50.85
6 to 13 inches	58.35	43.35	

Less than carload lots, from store, as follows:

	Steel	Iron	Seamless Steel
1 to 1¼ inches inclusive	40	35	42½
1¼ to 2¼ inches, inclusive	50	35	35
2½ inches, inclusive	52½	35	50
2¾ to 5 inches, inclusive	60	47½	42½

Merchant Pipe.—No impairment of the splendid line of orders, which have characteried this summer's trade, is in sight. There has been rather unusual buying, indicative of large consumption.

We quote on the base sizes, ¾ to 6-inch black steel pipe, 79.35 per cent discount, and 69.35 Chicago for galvanized pipe. Quotations on material from stock remain at 76 to 77 per cent discount on the base sizes ¾ to 6-inch black steel pipe.

Cast Iron Pipe.—Municipal contracts are now well out of the way for the summer, only occasional or supplementary orders from that source being seasonable. The Kansas City municipal award has been deferred for a week. Prices are higher. We quote four-inch water pipe, $33; six, eight, ten and 12-inch pipe, $32; larger, $31; gas pipe, $1 extra.

Coke.—The market has developed considerable strength for all grades of coke. Some large contracts have been closed during the past few days. There is a growing tendency to make annual coke contracts, running from summer to summer instead of from January to January. Both foundry and furnace cokes are firmer. Pocahontas furnace is quoted as high as $2.75 ovens, and Wise county, Va., foundry is $3 to $3.25 ovens. Solvay coke is strong at $5.50 to $5.75.

Old Material.—The better tone to the market reported a week ago has developed into a still stronger sentiment and has also brought out some buying, which a few weeks ago would have been regarded as very good. The Rock Island road this week is offering about 4,500 tons and the Illinois Central 1,200 tons. Nearly all grades are looking up, in quotations if not in actual sales. In the first paragraph below quotations are for gross tons:

Old Steel Rails (4 feet and over)	$15.75 to 16.25
Old Steel Rails (less than 4 feet)	14.25 to 14 75
Old Car Wheels	18.00 to 18.25
Old Iron Rails	21.00 to 21.50
Relaying Rails, subject to inspection	27.00 to 27.50
Heavy Melting Steel	13.50 to 14.00
Mixed Country Steel	11.50 to 12.00

We quote net tons, as follows:

No. 1 R. R. Wrought	$14.00 to 14.50
No. 2 R. R. Wrought	13.00 to 13.50
Shafting	16.00 to 16.50
Dealers' Forge No. 1	11.50 to 12.00
Wrought Pipe and Flues	9.50 to 10.00
No. 1 Cast, 150 pounds and less	13.50 to 14.00
No. 1 Mill	8.50 to 9.00
Mixed Busheling (No. 1 & No. 2)	8.50 to 9.00
Country Sheet	7.50 to 8.00
No. 1 Boilers Cut	9.00 to 9.50
Boiler Punchings	11.00 to 11.50
Iron Car Axles	22.50 to 23.00
Steel Car Axles	18.00 to 18.50
Iron Axle Turnings	9.50 to 10.00
Cast Borings	7.50 to 8.00
Mixed Borings, etc	7.00 to 7.50
Machine Shop Turnings	9.00 to 9.50
Railroad Malleable	13.00 to 13.50
Agricultural Malleable	13.00 to 13.50
Stove Plate and Light Cast Scrap	11.50 to 12.00
Old Iron Splice Bars	16.50 to 17.00

CLEVELAND.

Advance in Prices of Pig.—Heavy Ore Movement.—Bar Iron Higher.

Office of THE IRON TRADE REVIEW, BROWNING BUILDING, Aug. 7

Reports from all branches of the trade this week are remarkable for their uniformly optimistic tone. Every branch of the business is enjoying prosperity and the only fear entertained is that prices will advance too rapidly.

Iron Ore.—As predicted last week, the ore shipment for July did not quite reach the six million-ton point but nevertheless a new record was made, the total being 5,762,772 tons against 5,224,620 tons in July, 1905, a gain of 538,152 tons or 10.34 per cent. The shipments for June, 1906, were 5,489,256 tons. The total for the season to Aug. 1 is 17,004,368 tons, an increase of 965,694 tons, or 6.02 per cent over last year. The three ports at the head of the lakes, Superior, Duluth and Two Harbors, have shipped this season 67.65 per cent of the total against 64.90 per cent in 1905. The shipments by ports were as follows:

	July, 1905	Per cent of Total	July, 1906	Per cent of Total
Escanaba	784,242	15 01	827,097	14 35
Marquette	442,593	8 47	451,807	7.84
Ashland	524,915	10.04	490,536	8.51
Superior	832,626	15.94	917,761	15.93
Duluth	1,408,917	26.97	1,801,096	31.26
Two Harbors	1,231,327	23.57	1,274,415	22.11
Total	5,224,620	100.00	5,762,772	100.00

	To Aug. 1, 1905	Per cent of Total	To Aug. 1, 1906	Per cent of Total
Escanaba	2,521,613	15.72	2,865,505	15.09
Marquette	1,460,526	9.11	1,254,794	7 38
Ashland	1,647,167	10.27	1,679,359	9.88
Superior	2,467,029	15.38	2,671,536	15.71
Duluth	4,155,935	25.91	4,982 331	29 30
Two Harbors	3,786,404	23 61	3,850,943	22.64
Total	16 038,674	100.00	17,004,368	100.00

Furnace interests which did not cover fully for their requirements up to the opening of navigation next year are now engaged in a lively skirmish to obtain ore, especially old range Bessemer, and are finding extreme difficulty in meeting their needs. Ore merchants are deploring the tendency to advance the time for beginning sales of ore for next year. They feel that it is entirely too early to fix prices for ore, some of which would not be consumed until May, 1908. Rumors that an advance of 50 cents may be asked are declared to be without foundation. Conservative sellers realize that there is danger in advancing the price, and some of them are decidedly opposed to as much as 50 cents' advance. All favor postponement of discussion of prices until next winter, but buyers may be so insistent that this cannot be done.

Pig Iron.—There has been a sharp advance in all grades of pig iron, and some very high prices are being paid for prompt delivery. It is doubtful whether any iron can be bought in Cleveland at less than $18.45, delivered, for No. 2, and quite a large tonnage has been sold at that figure, while a small tonnage has been disposed of as high as $18.60 and $19 has been reluctantly named by sellers who did not care to quote, but did so at the earnest solicitation of buyers whose needs were pressing. Iron made at Ironton and other distant points is now being shipped to Cleveland with a freight rate of $1.45 to $1.50 per ton. Inquiries for fully 100,000 tons of basic are now pending for delivery for the first quarter of next year, for which time the quotation is $17.50 valley. For the same period, the quotation on No. 2 foundry is $17 and for Bessemer $17.75. Some sales of foundry iron have been made for the first quarter of 1907. It seems inevitable that the price of foundry grades and possibly of basic and Bessemer will advance for prompt shipment. It is estimated that Cleveland foundries will require 20,000 tons for the remainder of this year. Where it will be obtained, is a question. Sales of charcoal do not decrease, although the price has been advanced 40 cents. Sales last month were heavy. We quote, f. o. b. Cleveland, as follows:

Bessemer	$18.65 to 18.85
No. 1 Foundry	18.50 to 18.75
No. 2 Foundry	18.25 to 18.50
No. 3 Foundry	17.50 to 18.00
No. 2 Southern	18.00 to 18.25
Gray Forge	17.00 to 17.50
Gray Forge Southern	16.00 to 16.50
Lake Superior charcoal	19.50 to 20.00

Coke.—The market is firm at $2.75 for furnace and $3 for foundry coke. The demand is strong, and the supply somewhat limited.

Finished Material.—Although July was remarkable for the heavy specifications received, August promises to break the record of last month, and there is intense activity at the mills. The price of bar iron has been ad-

vanced $2 per ton to 1.60c per pound Pittsburg, and the demand is strong. The Cambria Steel Co. has advanced the price of steel bars from 1.50c to 1.60c, but it is not expected that other leading manufacturers will make the same advance. Jobbers are exceedingly busy. On sheets the best delivery is now from 10 to 12 weeks. The Tennessee Coal, Iron & Railroad Co. has sold its entire output of rails for 1907. Indications strongly point to more extensive use of the open-hearth rail which is manufactured by this company.

Old Material.—The tone of the market is much better and the tendency of prices is upward, but they are not notably higher. We quote:

Old iron rails	$21.00 to 22.00
Old steel rails (over 6 feet)	16.00 to 17.00
Old steel rails (under 6 feet)	16.50 to 17.00
Old car wheels	16.50 to 16.75
Steel boiler plate	13.00 to 14.00
Steel axles	19.00 to 20.00
Malleable iron (railroad)	15.00 to 15.50
Malleable iron (agricultural)	13.00 to 13.50
Heavy steel	15.00 to 15.50
Country mixed steel	13.00 to 13.50

We quote net tons as follows:

No. 1 R. R. wrought	15.50 to 16.00
No. 1 busheling	13.00 to 13.50
No. 1 machine cast	13.50 to 14.00
Iron axles	22.00 to 23.00
Axle turnings	10.50 to 11.00
Wrought turnings (free from cast)	9.50 to 10.00
Grate bars	10.00 to 10.50
Pipes and flues	12.00 to 12.50
Tank iron	11.50 to 12.00
Hoop and band iron	8.00 to 8.50
Sheet iron	7.00 to 7.50
Wrought drillings	9.50 to 10.00
Stove plate	10.00 to 10.50
Cast borings	7.50 to 8.00

CINCINNATI.

Firmness More Pronounced and $14 is Ruling Price for Southern Pig.

August 7.

Pig Iron.—The firmness which was apparent last week has been emphasized during the week under review and quotations for southern iron below $14 Birmingham have practically disappeared. In northern irons the tendency is also upward with many southern Ohio furnaces sold up on the higher grades for the balance of the year. Prompt shipment iron of either northern or southern brands is scarce and we already hear of premium prices being paid for prompt shipment No. 2 foundry. The lower grades from No. 3 foundry down are comparatively in better supply, but are being held at firmer prices. There has been more inquiry for gray forge and we hear of one melter in the market for 5,000 tons of this grade. The general inquiry is fairly active, but is mostly for moderate tonnages. The leading pipe interest is reported to be making inquiries. Some sales have been consummated for next year's delivery on a basis of $14.00 Birmingham. In the Ironton district, a quotation of $17.50 at furnace for No. 2 foundry has been made for next year's delivery. One Virginia furnace has advanced its price to $17.00 at furnace and Virginia basic is now quoted at $16.50 against $16.00 a week ago. One southern furnace is reported to be accumulating some spot iron and declares its intention of holding for a strong advance in prices. Consumers are calling for iron on contracts and shipments are unsatisfactory in many instances. Opinion prevails that stocks in the hands of consumers are below the average or normal supply. All of the surroundings of the situation appear to argue for continued firmness in the market. There is considerable talk in the trade of a probable shortage in the supply of iron. A number of furnace plants are out of commission, due to their physical condition and irregular labor supply and efforts to improve tonnage output are unsuccessful. We quote f. o. b. Cincinnati as follows:

Southern Foundry No. 1	$17.50 to 18.00
Southern Foundry No. 2	17.00 to 17.50
Southern Foundry No. 3	16.50 to 17.00
Southern Foundry No. 4	15.75 to 16.00
Southern Foundry No. 1, soft	17.50 to 18.00
Southern Foundry No. 2, soft	17.00 to 17.50
Gray Forge	15.25 to 15.50
Northern Foundry No. 1	18.15 to 18.65
Northern Foundry No. 2	17.65 to 18.15
Northern Foundry No. 3	17.15 to 17.65
Jackson County Silvery, 8 per cent	20.15 to 20.65
Southern Charcoal	24.00 to 25.00

Finished Material.—The demand continues unabated, and prices are well maintained. There is a good jobbing inquiry and but little improvement in deliveries of structural. Specifications on contracts for bar iron are fairly good.

We quote: bars at 1.63c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets, No. 10 and No. 12, in car lots are 2.68c. We quote black sheets, No. 27 at 2.53c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.90c; No. 27, 2.70c; No. 16, 2.25c; No. 14, 2.15c; No. 12, 2.10c. Tank plates are firm and sell out of store at 2c to 2.10c for ¼-inch and 2.10c for 3-16, Nos. 8 and 10. Beams and channels are quoted at 2.25c to 2.35c from stock and angles at 2.10c to 2.15c for base sizes.

In merchant pipe the demand is satisfactory and prices are unchanged. Independent mills are reported as closely following the schedule of the leading interests. We quote f. o. b. Cincinnati as follows:

MERCHANT PIPE.
(Basing Discounts)

	Steel Pipe		Guaranteed Wrought Iron Pipe	
	Black Per cent	Galv. Per cent	Black Per cent	Galv. Per cent
⅛ and ¼ inches	69.7	53.7	....	....
⅜ inch	73.5	61.3	....	....
½ inch	73.7	61.7	....	....
¾ to 6 inches	77.7	67.7	....	....
7 to 12 inches	72.7	57.7	....	....

Coke.—The market continues strong and it is difficult to get commitments from some operations. Prices in the leading coke producing districts are as follows:

Wise County, Va. Furnace Coke prompt shipment	$2.50 per ton
Wise County, Va. Foundry Coke on contracts	$2.75 to 3.00 per ton
Pocahontas Furnace Coke prompt shipment	$1.85 to 2.25 per ton
Pocahontas Foundry Coke on contracts	2.75 to 2.85 per ton
Connellsville Furnace Coke prompt shipment	2.50 to 2.85 per ton
Connellsville Foundry Coke on contracts	3.00 to 3.25 per ton
New River Foundry Coke on contracts	2.80 to 3.00 per ton
New River Furnace Coke, prompt shipment	2.25 to 2.50 per ton

†Wise County, Va., Coke on Furnace contracts is sold mainly on a sliding scale basis for pig iron prices on the following basis: $1.65 to $1.70 per ton on $9.00 pig iron, plus 17 percent of the advance on pig iron above $9.00 Birmingham.

Old Material.—The market shows improvement stimulated by the firmness in the pig iron situation. There is more inquiry from melters and prices are stronger. We quote f. o. b. Cincinnati.

Old No. 1 railroad wrought, net tons	$15.00 to 15.50
Cast machine and foundry, net tons	13.00 to 13.50
Old iron rails, gross tons	21.00 to 21.50
Old steel rails, gross tons	16.00 to 16.50
Old short lengths, gross tons	16.50 to 17.00
Old iron axles, net tons	22.00 to 23.00
Heavy melting scrap, gross ton	16.00 to 16.50
Stove plate, net tons	10.00 to 10.50
Wrought turnings, net tons	9.00 to 9.50
Cast borings, net tons	7.00 to 7.50
Car wheels, net tons	16.00 to 16.50

PHILADELPHIA.

Additional Heavy Sales of Basic.—Some Fancy Prices Paid for Foundry Irons.

August 7.

Pig Iron.—The enormous sales of basic iron referred to last week, and which has been increased by additional transactions to from 125,000 to 150,000 tons for eastern consumers from eastern furnaces, have had the double effect of sweeping the market almost clean of that grade and of putting up the price to the highest figure reached in a long time. The largest producers of basic say they will have only a few hundred tons for sale between now and Jan. 1, and $18.25 a ton is asked of the belated consumer who is still seeking to cover his requirements for the balance of the year. Curiously enough, there is still a considerable number of foundrymen, both large and small, who, disregarding all the lessons of experience, have not yet made their purchases. It is expected that these gentlemen will have to pay a dollar or two more than ruling prices for prompt delivery. Foundry irons have led in activity during the week, with an advancing tendency in prices. For special brands, and in cases of emergency, some fancy prices are being realized, even as high as $20, but as a rule No. 2X rules from $18.75 to $19.00, with an upward trend. No. 2 plain and standard gray forge have been advanced 25 to 50 cents, and low phosphorus remains firm. Considerable estimating is being done for the first and second quarters of 1907. Orders

are still coming in in large volume, but they are generally for from 50 to 1,000 tons, the largest purchasers having temporarily withdrawn from the market after covering their requirements. Prices may be quoted as follows:

No 1X Foundry	$19.25 to 19.50
No. 2X Foundry	18.75 to 19.00
No. 2 Plain	18.25 to 18.50
Standard Gray Forge	16.50 to 16.75
Basic	18.00 to 18.25
Low Phosphorus	24.75 to 25.00

New Material.—Each week sees an improvement in the demand for finished products of all kinds. The Cambria Steel Co. has advanced the price of steel bars $2. Bar iron is in better demand, and the activity of the mills engaged on heavy work continues at high pressure. Prices remain as follows:

Beams, channels and angles according to specifications, 1.83½c to 2c; refined iron bars, 1.63½c to 1.73½c; steel bars, 1.73½c; plates, 1.73½c to 1.83½c.

Old Material.—Between a better demand from the mills and speculative purchases by dealers, the tone of the scrap market continues to grow better, with prices advancing. With a long period of prosperity assumed to the blast furnaces and mills it seems impossible that scrap should not share in the good times. Prices are quoted as follows:

Old steel rails	$17.00 to 17.50
No. 1 steel scrap	16.50 to 17.00
Old steel axles	18.50 to 19.00
Old iron axles	25.50 to 26.00
Old iron rails	20.00 to 21.00
Old car wheels	16.50 to 17.00
Choice scrap, R. R. No. 1 wrought	18.50 to 19.00
No. 1 yard scrap	16.50 to 17.00
Machinery scrap	16.00 to 16.50
Low phosphorus scrap	20.50 to 21.00
Wrought iron pipe	13.25 to 13.75
No. 1 forge fire scrap	13.00 to 13.50
No. 2 forge fire scrap, ordinary	10.00 to 10.50
Wrought turnings	11.50 to 12.00
Axle turnings, heavy	12.50 to 13.00
Cast borings	9.50 to 10.00
Stove plates	11.50 to 12.00

NEW YORK.

Foundry Iron Sales Good.—Prices Very Firm.

Office of The Iron Trade Review.
Room 1315, No. 150 Nassau St., Aug. 6

Pig Iron.—Sales have been good during the week but not extraordinary. The decline in tonnage is, however, not due to any dullness, but rather to the fact that an abnormal amount of business had been done during the preceding weeks. Many producers are out of the market and a large proportion of the melters are supplied for the balance of the year. It is becoming actually difficult to secure spot iron, but the talk of premiums except in the case of basic is still mainly talk. In the meantime prices are rather firmer than higher, again excepting the case of basic, which rules 25 to 50 cents higher than two weeks ago. Lower grades of foundry, which have been somewhat below their relative position for some weeks past, have crept up to nearly their normal level as compared with Nos. 1 and 2.

The week's sales in the eastern market will probably reach a total of about 125,000 tons of which fully half represents basic mostly placed in the district surrounding Philadelphia. Transactions in foundry grades were mostly in moderate-sized lots with a sprinkling of blocks from 1,000 to 2,500 tons. A stove manufacturer is reported to have placed a contract for 2,500 tons out of a total requirement of 4,000 tons, and a machinery manufacturer one of 1,500 tons. To date the requirements of the General Electric Co., 4,000 tons, have not yet been filled and there are calls for bids on several round lots, among others from a foundry in New York state which needs 1,500 tons. The tonnage at present under negotiation will probably cover a total of 20,000.

Consumption shows no signs of diminution. It is, in fact, said to be on the increase. Few of the well informed are, however, of the opinion that an actual shortage will occur, the general belief being that the necessity for importations will not arise.

There have been no heavy transactions in ferro-manganese during the week and prices remain about the same. The situation in the coke market is approximately the same as in that of pig iron, a growing demand and firmer prices.

The following are prices of pig iron at tidewater:

Northern No. 1 Foundry	$19.00 to 19.50
No. 2 Foundry	18.25 to 18.75
No. 2 Plain	18.00 to 18.50
No. 1 Southern Foundry	18.00 to 18.50
No. 2 Southern Foundry	17.50 to 18.00
No. 3 Southern Foundry	16.75 to 17.25
No. 4 Foundry	16.00 to 16.50

Pig Iron Certificates and Warrants.—Interest has revived and prices of both certificates and warrants acquired a firmer tone during the week. There were no sales of note. The following are today's quotations for standard foundry contracts on the New York Produce Exchange.

Standard Foundry Contracts.

	Bid.	Asked.
July	17.50	
August	17.50	18.00
September	17.70	18.00
October	17.75	18.00
November	17.65	18.00
December	17.70	18.00

Finished Iron and Steel.—The midsummer lull in the market for the heavier products continues, but shipments show no falling off and the demand for the lighter forms of finished material has, if anything, improved. August is not expected to be a heavy month as regards booking of new business in steel rails and structural shapes. Specifications on old contracts have, however, been liberal, so that the volume of business which has actually reached the mills is fully up to capacity. In rails new business has been confined to comparatively small orders from trolley roads and manufacturers of frogs and switches. The Pennsylvania R. R. has specified on another 50,000 tons of its total of nearly 190,000 tons previously reported.

The American Bridge Co. reports the receipt of a moderate amount of business chiefly in small lots. The contract for the rail mill at the Gary plant has not yet arrived, but there were two orders for the big plant involving about 900 tons of material for the brick shed and the power house. The Western Pacific order for about 5,000 tons of bridge work went to an eastern producer. Little progress has been made upon the several large projects under way in this city. In one case the buildings have been torn down and the ground prepared for operations only to lie idle while no call for bids has yet been issued for the several thousand tons of steel required. The vicissitudes of the Manhattan bridge project are apparently not yet at an end, for the contract for steel has not been placed and few seem anxious to secure it.

The local market for steel plates has had a satisfactory run of routine business in small lots. The contract for material for the steel pipe line in Philadelphia has been awarded one of the mills in the Pittsburg district. The bar iron market has improved in tone, the demand being fair and the official prices remaining the same.

The following are prices at tidewater: Angles, 3 to 6 inches x ¼ inch and heavier, 1.84½c; beams, 3 to 15 inches, 1.84½c; tees, 3 x ¼ inch and heavier, 1.89½c; plates, carloads, tank, 1.74½c; flange, 1.84½c; marine boiler, 2.41½c; refined iron bars, 1.54½c to 1.64½c; soft steel bars, 1.64½c; sheets, No. 28 black, 2.50c.

Old Materials.—The demand for steel and cast scrap has improved markedly and prices are decidedly stronger. This is especially true of cast scrap of which there seems to be little left in local yards. The demand for wrought scrap has not improved materially and prices remain about the same. Sales reported during the week included 1,500 tons of heavy melting steel to be delivered in eastern Pennsylvania, 500 tons of heavy section tee rails and 100 tons of cast scrap. The

following are prices approximately f. o. b. tidewater:

Old iron rails	$20.00 to 21.00
Old steel rails, long lengths	15.00 to 15.50
Old steel rails, short pieces	14.50 to 15.00
Relaying rails	25.00 to 26.00
Old car wheels	16.50 to 17.00
Old iron car axles	25.00 to 26.00
Old steel car axles	18.00 to 19.00
Heavy melting steel scrap	14.50 to 15.00
No. 1 railroad wrought scrap	16.00 to 16.50
Iron track scrap	14.50 to 15.00
Wrought pipe	12.50 to 13.50
Cast borings	9.00 to 9.50
Wrought turnings	11.50 to 12.00

ST. LOUIS.

Scarcity of All Grades of Pig and Prices Tend Upward.

August 6.

Only a comparatively small amount of iron has been sold in this market in the last week, but the shortage of all grades has held the market firm with a tendency to advance quotations. Fourteen dollars is the minimum for sales for the last quarter, while little No. 2 iron for immediate shipment can be had under $14.50. One house is quoting $15, but since this house has little iron of any character to offer, this price is hardly a criterion. It goes to show, however, that southern iron men, far from expecting a decline, look for another advance.

All indications point to a further rise. On account of labor troubles and closing down for repairs there are only eleven furnaces in blast in Alabama today. The same conditions are largely true in other sections of the south. In the Birmingham district, while there are no thoroughly organized unions, the furnace men are quitting their jobs to seek other employment, many of them to work in the harvest fields of Kansas.

In the face of this iron melters are calling loudly for deliveries. Despite the fluctuations in the price of pig, there has been no abatement in the consumption of all grades of iron. It is as much as many of the furnaces can do to keep up with their order books, and these have instructed their agents that they are temporarily out of the market. Since last week, when we reported two of the largest furnaces had closed their order books two more large producers have temporarily withdrawn from the market.

Iron quotations, including the freight rate of $3.50 to East St. Louis range as follows:

Southern No. 1	$18.00 to 18.50
Southern No. 2	17.50 to 18.00
Southern No. 3	17.00 to 17.50
Southern No. 4	16.75 to 17.25
Gray Forge	16.50 to 17.00

Coke.—Coke continues strong with a fairly good volume of business. Prices run from $5.80 to $6.30 in East St. Louis. Many consumers, fearing a shortage of cars, are beginning to ask for immediate shipments.

Finished Material.—No large contracts have been closed since our last report, but business along the general lines has been satisfactory. The plans for the new Butler Brother's building were submitted to the contractors today. The contract for the fabricated material, about 4,500 tons, will probably be let during the week.

BIRMINGHAM.

Important Producers Withdraw.—Furnaces Will Resume.

August 6.

Alabama pig iron manufacturers have sold so much iron that some of them, yes three or four companies, have withdrawn from the market, as far as delivery goes within the next three or four months. No. 2 foundry cannot be had except at a premium under three month's delivery. The new quotation, $14 per ton No. 2 foundry, has established itself firmly. It is stated that the prices are looking up and immediate delivery iron, in small lots, as well as special analysis iron brings $14.50 per ton. The production is still under normal, though reports come to the center from throughout the district that two furnaces are now ready for the torch and two others will shortly be ready. While it is not announced when these furnaces will be blown in, except as to the furnace of the Southern Steel Co., which should be making its usual output of iron by the the 15th or 20th inst., it is believed that very little time will be lost in getting the furnaces down to work again. The sales since the break in the iron market in June have been steady. The low prices did not prevail very long. The new price of $13.50 held on strongly until there was a good lot of iron disposed of. An effort to advance quotations to $13.75 did not succeed, but a few days later it became necessary, the demand equalizing the price, to raise the price fifty cents and in all quarters the announcement was made that $14 was the price. Inquiry today revealed the strength of the market and the statement that $14.50 per ton quotations were looked for in the near future.

Labor is still scarce at the furnaces. At one furnace in this state a day or two time was lost the past week on account of labor troubles around the furnaces.

The Southern Steel Co. is considering a proposition to increase its capital stock from $16,000,000 to $21,000,000. A meeting of the stockholders and directors will be held in Gadsden on Sept. 1 for the purpose of considering this increase. It is rumored, confirmation not obtainable, that the Southern Steel Co. is likely to absorb the Lacey-Buck Iron Co. and the Chattanooga Iron Co. Both of these smaller companies have a furnace apiece with valuable coal and ore properties, besides numerous coke ovens.

Another step has been taken in the legal complications into which the Lookout Mountain Iron Co. has found itself. The creditors recently had a meeting and made inquiry of some of the officers of the concern to ascertain financial conditions. C. A. Stillman was named as trustee and he made the required bond. Later a petition was filed in the federal court looking to the nullifying of the first and second mortgages of the company. The properties are to be sold in October. The liabilities of the company are estimated at nearly a million and a half and the assets at something over $1,250,000.

Steel plants in Alabama are losing no time in their operation and the output is heavy. There is demand for every ton of steel that can be produced. The Empire Plow Co. will resume operations at its Ensley, Ala. plant in September, the woodworking department now being on.

An announcement of considerable interest in the iron world in this section of the country is the call by the district executive board of the United Mine Workers of America for a special convention of the Alabama union miners' organization to be held Aug. 14. While officers of the district organization announce that the purpose of the meeting is to discuss the welfare of the organization, it is generally understood that the convention will consider the question of calling off the strike which began in July, 1904. The strike has cost the miners no less than $1,500,000 while the expense to the operators has been greater. The new labor brought to the mines has about gotten acquainted with the work and the coal production at furnace company's mines has been improving right along. The Pratt mines division of the Tennessee Coal, Iron & Railroad Co. last Thursday produced nearly 7,000 tons of coal, the largest output at this place since the strike began. It is believed that the union miners will take up work wherever they can get it. How much of this labor the furnace companies will take back remains to be seen.

The total production of zinc in the United States during 1905 was more than 200,000 tons against 40,688 tons in 1885, and imports in both block and sheet form have shown a heavy decrease during that period.

THE IRON TRADE REVIEW

Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades.

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August 9, 1906

STEEL CORPORATION RESUMES COMMON STOCK DIVIDENDS.

In the second quarter of 1902, when the United States Steel Corporation was just beginning the second year of its existence, its earnings were $37,662,058. It has taken a long time for the corporation to break that record, but it did so in the second quarter of this year, the earnings, as given last week, amounting to $40,125,133, or $2,462,975 in excess of the previous record. As a matter of fact, however, the real earnings of the corporation have been ahead of the previous record since last September. A change in the method of bookkeeping was inaugurated Jan. 1, 1904, one result of which has been that profits on iron ore are no longer credited as the ore is mined, but are returned as the finished material leaves corporation ownership. The effect of the former system was to concentrate earnings in the two middle quarters of the year. Thus they were heavy in the two middle quarters of 1902, dropping by several millions in the two succeeding quarters, again becoming large in the two middle quarters of 1903, and dropping by more than one-half to the last quarter of 1903. The fluctuations in iron trade prosperity were not after that fashion.

Since the change in the method of bookkeeping, the quarterly earnings have been in direct sequence to the condition of trade. Beginning with the fourth quarter of 1904, when the $21,466,632 earned showed an increase over the previous quarter, there has been an increase in each quarter. A continuance of that increase will undoubtedly be shown in the current quarter.

The calendar year 1902, with $133,308,764 of net earnings, has been the best in the corporation's history for a year's showing, 1905 coming next with $119,787,658. The twelve months ended June 30, 1906, however, make the best twelve-month record, $143,216,169, and when the results for the full calendar year 1906 are reached, the total will undoubtedly be still larger, as it will doubtless lie between $150,000,000 and $160,000,000.

The corporation's earnings per ton are very much less than they were in 1902. The production of its then plants has been increased, it has built extensions to them, and it has acquired the Union-Sharon and Clairton properties. Experience thus far has shown these purchases to have been very advantageous. Except for the $1,000,000 of second mortgage steel corporation bonds given the Crucible Steel Co., and costing $50,000 a year, they have not increased the interest and dividend obligations which come out of the quarterly earnings as reported, since, with the slight exception noted, the purchases were made by guaranteeing bond issues of subsidiary companies, and the interest on such subsidiary company bonds is deducted before the quarterly earnings statement is made. The deductions from these earnings are increased, with respect to sinking funds against the subsidiary company bonds and charges for depreciation. Still, there is no doubt that these plants are contributing more than enough to pay these charges, so it remains that in every respect the increased earnings of the corporation, compared with 1902, are due to the larger operations. In 1902 prices in many lines were fictitious in that the stress of independent competition would not permit their continuance. This was notably so with tin plates, sheets and merchant pipe. At the present time all prices are competitive, so far as the existence of independent production goes.

On this excellent showing the resumption of dividends on the common stock was expected, and cannot be criticized. There are some who might prefer to see everything else done first, but the disbursement is moderate, at the rate of but $10,166,050 per year, and the probabilities are that earnings will be very large for several years to come.

GREAT PRODUCTION OF PIG IRON.

It was regarded as a remarkable record when the American Iron & Steel Association announced that the United States had made 22,992,308 gross tons of pig iron in the calendar year 1905, this being a gain of nearly 5,000,000 tons over the best previous year. The midsummer pig iron statistics, which are given in detail elsewhere in this issue, show a production of 12,602,901 tons in the first half of this year, and adding this to the production of 11,829,205 tons in the latter half of 1905 shows a production of 24,432,106 tons in the twelve months ended June 30 last, nearly a million and a half tons more than was made in the calendar year.

Since the latter part of last year, all blast furnaces have been in operation except such as were out for repairs and such as can operate only when the market is extremely high. The full capacity under ordinarily prosperous conditions has been brought out. That capacity was regarded, at the beginning of this year, as a trifle under 25,000,000 tons per year. The rate of production may have been higher at times, but only because an abnormally small proportion of the total capacity was out for relining. The rate has dropped in the past few months because a rather large number of linings had played out. Mr. Swank records the new furnaces which have been blown in during the first half of the year, and it can be estimated that they probably contributed about 140,000 tons to the first half's output. Accordingly, the furnaces which had been built up to January 1 last made a trifle less than 12,500,000 tons of pig iron in the first half. It can be estimated further

that the new furnaces will make about 250,000 tons more in the second half than they did in the first half, so that without the advent of new furnaces a continuance of the same conditions as existed in the first half would mean that the calendar year's output will be 25,450,000 tons. A few more furnaces are to be completed during the second half, and the year's results may possibly exceed 25,500,000 tons.

There was an increase in the total pig iron production in the first half of this year, against the latter half of last year, of 773,696 gross tons. The increase in the make of Bessemer was 477,098 tons, and in basic the increase was 310,688 tons, a total of 787,786 tons, or more than the total increase. Charcoal pig production increased 21,719 tons, so that of pig iron outside of Bessemer and basic and charcoal there was a decrease of 35,809 tons. Ferro and spiegel showed a decrease of 3,816 tons. The balance must come out of forge and foundry and some miscellaneous and unimportant grades. That a large part of the decrease was in forge, rather than in foundry, might be surmized from the decline in forge which the 1905 statistics showed, but again that decline might have been only temporary.

At any rate it is quite evident that it is the demand for steel which has forced production of pig iron. The demand for steel-making pig is not satisfied, as recent market history shows.

RECORD IRON AND STEEL EXPORTS.

As foreshadowed in these columns five weeks ago, our iron and steel exports for the fiscal year ended June 30, 1906, broke all previous records by nearly a quarter million tons, the total of all lines reported by weight, as computed from advance sheets of the June *Monthly Summary* being 1,330,871 gross tons, against 1,133,586 gross tons in the previous fiscal year, which had held the record. The total value of all iron and steel exports was $160,984,985, against the record of $134,728,363 made in the previous year. The returns by value cover all iron and steel exports, except agricultural machinery, thus including hardware, machinery, etc., the weight of which is not returned.

Tables are appended which show both imports and exports in all the lines for which weights are returned.

It will be observed that exports in June last were at but a slightly less rate than that shown for the entire fiscal year ended with June, while an increase of 36,000 tons is shown over June of last year. The total increase, comparing fiscal years, is 197,285 gross tons according to the returns, but the real increase is not so large, since pipes and fittings, 147,497 tons in the fiscal year 1906, were not returned by weight in 1905. There is no doubt, however, that the total in that year was not nearly so large.

IRON AND STEEL EXPORTS FROM THE UNITED STATES—GROSS TONS.

	June*		Year ending June	
	1905.	1906.	1905.	1906.
Pig iron ...	1 390	6 641	56 971	59 509
Scrap	716	917	19 788	10 241
Bar iron ..	1 776	4 065	32 323	42 763
Steel bars ..	930	2 540	24 167	22 530
Wire rods ..	864	296	15 738	6 482
Crude steel ..	9 703	17 281	236 155	273 272
Hoops, etc	278	323	3 029	5 042
Steel rails ..	22 340	25 996	409 429	345 826
Sheets and plates:				
Iron	926	1 414	5 557	10 278
Steel	8 879	6 590	70 992	78 149
Tin plates...	815	1 173	10 264	11 592
Structural ..	4 997	11 719	73 287	97 668
Wire	12 520	15 515	126 190	164 253
Nails and spikes:				
Cut	1 583	724	9 101	6 868
Wire	3 540	3 392	36 856	44 568
All other ..	233	291	3 739	4 333
Pipes and fittings ...	*	8 709	*	147 497
Totals ...	71 492	107 586	1 133 586	1 330 871

*Quantity not stated prior to July 1, 1905.

An increase of about 100,000 tons is shown in the following articles, which are the more finely finished: Bar iron, hoops, sheets and plates, tin plates, structural material, plain wire and wire nails. In the less finished forms the net result is a decrease, since while pig iron and crude steel increased 40,000 tons, scrap, steel rails and wire rods decreased just twice as much. The net result of the whole comparison is to show that our iron and steel exports have largely increased, and that the average degree of finish is much advanced.

Ten years ago our iron and steel exports were not a tithe of what they are now, the total having attained the dignity of six figures. Ten years ago, in the fiscal year 1895, we exported 22,517 gross tons of pig iron, 10,089 tons of steel rails, 27,274 tons of wire, and a few thousand tons each of scrap, bar iron, crude steel, cut nails, wire nails and plates. The depression which seized the iron and steel trade in the summer of 1893 found the manufacturers totally unprepared to relieve the situation by exports, and in the following twelve months, constituting the fiscal year 1894, the exports were small, comprising 26,520 gross tons of pig iron, 15,561 gross tons of steel rails, 20,000 tons of wire, and smaller quantities of a few other lines. Should a similar depression now seize the trade, exports would immediately jump to enormous proportions. As the depression inaugurated in 1893 progressed exports grew under the stress, but were confined largely to the crude materials.

By the fiscal year 1898 pig iron exports had grown to 227,465 tons, steel rail exports to 229,783 tons and crude steel exports to 16,100 tons. Curiously enough, and illustrative of the hard straits to which American manufacturers had been driven, there were exported 8,403 tons of ferro-manganese. The pig iron exports were chiefly of southern iron, and made, it was admitted afterwards, at a loss. Should Alabama again be forced to exports, the state would export crude steel, rails and wire, and do so at a profit instead of a loss.

IRON AND STEEL IMPORTS INTO THE UNITED STATES—GROSS TONS.

	June.		Year ending June.	
	1905.	1906.	1905.	1906.
Pig iron ..	17 117	22 906	122 977	271 790
Scrap	1 669	490	12 650	25 810
Bar iron....	4 090	4 351	26 669	37 817
Rails	8 277	389	17 025	9 635
Hoops, etc...	232	260	1 918	11 197
Crude steel	910	2 275	9 800	19 643
Sheets	231	679	2 108	3 297
Tin plates...	5 416	4 458	71 905	53 937
Wire rods...	1 514	2 146	15 282	18 495
Wire & mfrs.	258	544	3 851	4 623
Structural ..	619	2 464	3 157	35 598
Chains	31	26	278	311
Anvils	21	50	176	243
Totals	40 385	41 038	287 796	492 396

While the export iron and steel movement shows results which are both interesting and gratifying, the showing of imports must likewise attract attention. From one fiscal year to the next they have grown by more than 200,000 tons. In times past large imports have been an indication that domestic manufacturers were not able to compete with the foreign product even, in most cases, aided by a fairly large import duty. The imports of the present day are no such indication. It

is to be observed that, comparing the past two fiscal years, pig iron imports rose from 122,977 to 271,790 gross tons, scrap from 12,650 to 25,810 tons and crude steel from 9,800 to 19,643 tons. These are manufacturers' materials and they came in chiefly to be remanufactured and exported, with benefit of the 99 per cent rebate in duty. These large increases indicated no inability on the part of domestic manufacturers to compete. Neither did the increases of 10,000 tons in hoops (doubtless cotton ties), 3,000 tons in wire rods and 32,000 tons in structural material. In these lines the domestic manufacturers were crowded with business. Tin plate imports decreased 18,000 tons, due to the capture of a large part of the rebate trade by the leading domestic manufacturer, aided somewhat by a concession in wages applying only on material made for this purpose.

It has been intimated that our increased imports do not rest on the same foundation as formerly. This can be brought out by comparison with previous periods when imports were large. In 1902 there was a famine in iron and steel in the United States. It was not as real as some imagined, and larger orders were placed abroad than were found to have been necessary. As a result, the imports in the twelve months ended June, 1903, amounted to the enormous total of 1,723,251 tons. Much of the material was not needed, and contributed greatly to the brief depression towards the close of 1903. This was a heavy import movement which can now be characterized as largely a mistake. In earlier times there was a heavy movement which was due to the inability of domestic manufacturers to compete. Prior to the panic of 1873 all costs of manufacture were very high, and in the calendar year 1872 no less than 1,183,066 gross tons of iron and steel were imported, although the statistical compilation was not nearly as full as now. With the panic of 1873 imports promptly dropped to a minimum of 204,211 tons in 1876, but with the boom of 1879 they swelled reaching the highest total in the country's history, 1,886,019 tons, in the calendar year 1880. In 1887, the greatest year for railroad building, they reached another high mark, 1,783,256 tons.

NEW FURNACES

Have An Annual Capacity of 880,000 Gross Tons.

The American Iron and Steel Association has compiled the following list of entirely new furnaces which have been blown since Jan. 1, 1906. All these furnaces were in course of construction on Dec. 31, 1905:

Burden furnace, the Burden Iron Co., Troy, New York. One anthracite coal and coke stack, 80 by 17½; ore, northern New York magnetic concentrates; product, forge pig iron; estimated annual capacity, 90,000 tons.—Blew in May 27, 1906.

Lackawanna furnace No. 6, Lackawanna Steel Co., Buffalo. Furnace at Lackawanna, New York. One coke stack, 94 by 24; construction commenced June 7, 1902; ore, Lake Superior; product, Bessemer pig iron; estimated annual capacity, 220,000 tons.—Blew in May 1, 1906.

Cambria furnace No. 7, Cambria Steel Co., Philadelphia. Furnace at Johnstown, Pa. One coke stack, 85 by 22; construction commenced in 1903; ores, Lake Superior hematite and native and foreign manganiferous; product, Bessemer and basic open-hearth pig iron; estimated annual capacity, 150,000 tons—Blew in Jan. 18, 1906.

Chattanooga furnace, Chattanooga Iron & Coal Co., Chattanooga, Tenn. One coke stack, 75 by 15½; construction commenced in March, 1905; ores, red and brown from Georgia and Alabama; product, foundry pig iron; estimated annual capacity, 55,000 tons.—Blew in April 25, 1906.

Mingo furnace No. 4, Carnegie Steel Co., Pittsburg. Furnace at Mingo Junction, O. One coke stack, 90 by 21½; construction commenced March 21, 1905; ore, Lake Superior; product, Bessemer pig iron; annual capacity, 145,000 tons—Blew in Jan. 21, 1906.

Furnace E, Illinois Steel Co., Chicago. Furnace at South Chicago. One coke stack, 90 by 22; construction commenced Sept. 10, 1905; ore, Lake Superior; product, Bessemer pig iron; estimated annual capacity, 180,000 tons.—Blew in late in June, 1906.

Cadillac furnace, Mitchell-Diggins Iron Co., Cadillac, Mich. One charcoal stack, 60 by 12; construction commenced May 3, 1905; product, malleable, car-wheel, and foundry pig iron; estimated annual capacity, 40,000 tons.—Blew in March 6, 1906.

Number of entirely new furnaces which have been blown in since Dec. 31, 1906, seven, of which five use coke for fuel, one uses anthracite coal and coke mixed, and one uses charcoal. Total estimated annual capacity of these furnaces, 880,000 gross tons, of which 750,000 tons are coke, 90,000 tons are anthracite coal and coke mixed, and 40,000 tons are charcoal.

Building Furnaces.—On June 30, 1906, there were sixteen furnaces in course of construction, of which 15 will use coke for fuel when completed and one will use mixed anthracite coal and coke. Of the coke furnaces six are being built in Pennsylvania, two in Alabama, three in Ohio, two in Illinois, one in Wisconsin, and one in Colorado. The single mixed anthracite coal and coke furnace is being built in the Lehigh valley. In addition two furnaces were being rebuilt on June 30, of which one coke furnace was in western Pennsylvania and one coke furnace was in Michigan. The last mentioned furnace when last in operation used charcoal, but is to blow in on coke in August.

Furnaces in Blast.—The whole number of furnaces in blast on June 30, 1906, was 323, against 313 on Dec. 31, 1905, and 294 on June 30, 1905. The number of furnaces idle on June 30, 1906, was 106, against 111 on Dec. 31, 1905, and 138 on June 30, 1905.

During the first six months of 1906 the number of furnaces actually in blast during a part or the whole of the period was 361, as compared with 349 during the last half of 1905 and 334 during the first half of that year.

New Buffalo Foundry.—The Day Founding Co, organized at Buffalo with a paid up capital stock of $20,000, has begun operations at Mississippi and Mary streets. The company is fitting up the plant recently vacated by the Kellogg Iron Works, which moved its foundries to a point near the Buffalo city line along the lake shore. William Smith is president of the new concern; P. B. McNaughton is vice president, and R. F. Day secretary and treasurer. A general foundry business will be conducted, especially in the manufacture of brass, aluminum and bronze castings. The plant is not as yet operating at full capacity, but the management expects within a few weeks to be running with a large force of men. It promises to be a thrifty industry.

Edward D. Carter, a well-known vessel owner of Erie, has closed a contract with the American Ship Building Co. for a freighter of 9,000 tons capacity. The new boat, which will cost $335,000, will be ready for business at the opening of navigation next spring. She will be 524 feet over all, 504 feet keel, 54 feet beam, and 30 feet deep. This order makes nineteen freight steamers that the American Ship Building Co. has contracted for this year.

Metal Market

NEW YORK.

Aug. 6

According to the monthly statistics collected and arranged by C. Mayer, secretary of the N. Y. Metal Exchange, the total visible supply of tin on July 31 of this year was 86 tons below that of the corresponding date of last year. The total of deliveries into channels for consumption during the seven months since Jan. 1, was 500 tons larger than that of the corresponding period in 1905. The total visible supply for the United States and Europe was on the last day of July, 12,184 tons. The exports of copper for the seven months ending with July showed a decrease of 29,000 tons as compared with the corresponding period of last year.

Pig Tin.—Prices advanced rapidly owing to speculative activity in London. The following are today's local quotations, a bank holiday in London resulting in no quotations from abroad: Spot 40¼ to 41¼; August, 40 to 41; Sept., 39.90 to 40.90. Arrivals for the month to date, 25 tons; afloat, 1,988.

Copper.—Although statistics show that the available supply has increased since the first of the year by 50,000 tons the market remains unchanged. Today's quotations: Lake, 18⅝ to 18¾; electrolytic, 18¾; casting, 18 to 18½. Exports for the month to date, 1,742.

Lead.—The market continues very dull. Today's closings, 5.75; St. Louis, 5.65.

Spelter.—The demand has been moderate and the market closes steady. Today's quotations: 6.00 to 6.10; St. Louis, 5.92½.

Antimony.—The market is weak and nominal. At today's close Cookson's is held at 23c to 24c; Hallet's, 23c asked; other grades, 21c to 22c.

CHICAGO.

August 7.

The market for both new and old metals is active and stronger. Prices for tin have advanced and both copper and spelter are a shade higher. Inquiries for the old metals have become more persistent.

Lake copper is now quoted at 18⅝c to 18¾c; electrolytic, 18½c to 18¾c, and casting, 18c to 18¼c. Pig tin, car lots, 39c to 40c; jig lead, desilverized, 6c to 6.10c for 50 ton lots; corroding, 6.50c to 6.55c for 50 ton lots; sheet zinc, $7.75 list f. o. b. LaSalle in car lots of 60-lb. casks; spelter, prompt delivery, 6.10c to 6.15c; Cookson's antimony, 25c; other grades, 23c to 24c; nickel, 47c for round lots, and 50c to 60c for smaller.

On old metals we quote, copper wire, 16¾c; heavy copper, 16½c; copper bottoms, 16¼c; copper clips, 16c; red brass, 16c; red brass borings, 14½c; yellow brass, 12¾c; yellow brass borings, 10¾c; light brass, 9½c; lead pipe, 5¾c; zinc, 5c; pewter, No. 1, 24c.

ST. LOUIS.

August 6.

Spelter was lower and weak today. It dropped from $5.92½ to $5.90 at which figure 100 tons were sold. More was offered at the same figure, but was untaken. Lead has ruled quiet all week but the price has remained at $5.65. Fifty tons Missouri brand were sold at this price today.

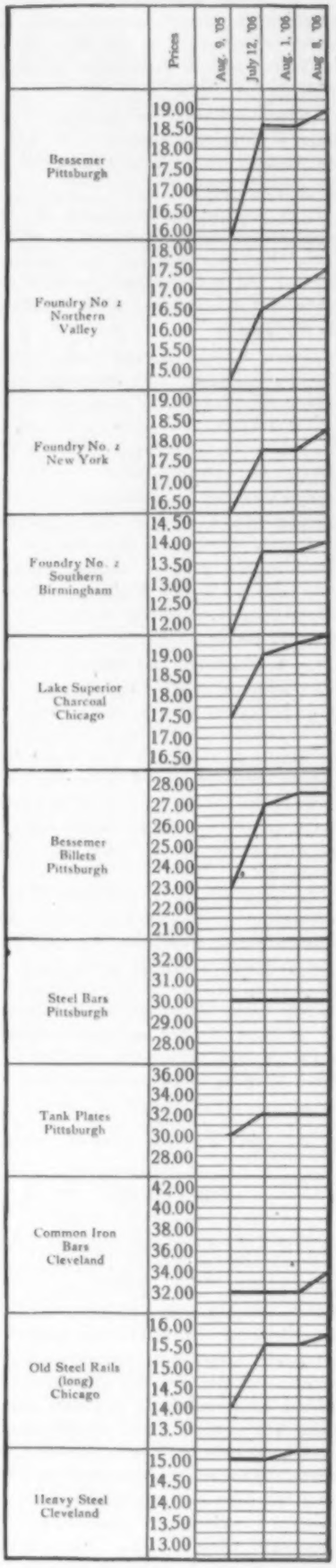
The total values of zinc and lead ores shipped from the Joplin district during the 31 weeks of 1906 aggregate $8,746,313, a gain of $1,088,978 over the same period of 1905. This was accomplished by higher lead prices and an increased shipment of 13,287 tons of lead and 4,451 tons of zinc. Ore prices remained practically unchanged from last week.

THIRTY-TWO VESSELS
Already on Books and More Orders Are Pending.

The program of ship construction on the great lakes for 1907 delivery includes thirty-two vessels, of which thirty are bulk freighters, one passenger steamer and one car ferry. Twenty-one of these vessels will be built at the various yards of the American Ship Building Co., of which nineteen are bulk freighters, the other two being the passenger boat and car ferry mentioned; seven will be built at the yards of the Great Lakes Engineering Works, Detroit; three at the yard of the Toledo Ship Building Co., Toledo, and one at the yard of the Collingwood Ship Building Co., Collingwood, Ont. The thirty bulk freighters range from 5,500 to 12,000 tons carrying capacity, one of them being 5,500 tons, three of them 6,500 tons, six of them 7,000 tons, three of them 9,000 tons, nine of them 10,000 tons, one 11,000 tons and seven of them 12,000 tons. The total carrying capacity on a single trip is 280,000 gross tons, or conservatively 5,600,000 tons in an average season. Nor is this all. Other contracts for vessels are pending.

New Can Factory.—The American Can Co. is about to begin the construction of a large can factory at New Castle, Pa., and a site near the Shenango tin plate mill of the American Sheet & Tin Plate Co., has been secured. Geo. Greer, of the American Sheet & Tin Plate Co., and T. F. Morehead, of New Castle, were largely instrumental in inducing the can company to locate at New Castle, although the close proximity of the Shenango mill was the chief incentive.

PRICE CHART.



PERSONALS.

Russell M. Bennett announces the removal of his offices to suit Nos. 710 to 718 in the New Security Bank building, Minneapolis, Minn.

Anderson Fowler, of the New York office of Rogers, Brown & Co., sailed for Europe, Saturday, August 4, by the Cunard line.

T. N. Harris, superintendent of the mines of the Southern Steel Co., at Altoona, Pa., has resigned his position and has accepted a similar one with the Alabama Consolidated Coal & Iron Co. at Mt. Pinson.

Thomas B. Burnite, who until recently has been connected with the engineering department of Chas. C. Moore & Co. of San Francisco, has accepted a similar situation with the John A. Traylor Machinery Co., Denver, Colo.

John Farquhar, secretary of the Lackawanna Steel Co., has resigned it is understood with the purpose of resuming the practice of law. He is succeeded by F. F. Graham, assistant secretary, and for many years an employe of the company.

F. A. Lathrop, for the past two years with the Mark Mfg. Co., has become associated with L. B. Jenks, who has charge of the Chicago office of the Youngstown Sheet & Tube Co. Mr. Lathrop was connected with the National Tube Works Co. up to the time of the merger and for five years thereafter with the Western Tube Co., Kewanee, Ill.

Mansfield Merriman, professor of civil engineering at Lehigh University, has been granted a leave of absence for one year and will spend the greater part of the year in practice as a consulting engineer, being associated with Clarence W. Hudson, former assistant engineer of the Phoenix Bridge Co., who has tendered his resignation to take effect September 1. Prof. Merriman and Mr. Hudson will have offices at 45 Broadway, New York.

OBITUARY.

Albert W. Fiero, of Chicago, who died July 28, was born in Battle Creek, Jan. 29, 1849. He was an engineer for the Peninsular railway, now part of the Michigan Central railway, and for the Joliet Steel Co. Afterwards he represented the Chicago & Alton and several other railroads as inspector of rails. He made a study of the manufacture of rails and was one of the foremost testing engineers in the country. He was a member of the Western Society of Engineers, the Engineers' Club of New York and the American Society for Testing Materials.

Dwight Slate, the inventor of a number of drills and other tools, died at Hartford, Conn., on July 31, at the age of 90 years. In the past, he was identified with several large manufacturing firms.

Edgar Brown, a pioneer iron man and the discoverer of the Mesabi and Vermillion ore ranges, died on August 6 at Sault Ste. Marie. Mr. Brown developed the ranges until they were worth $13,000,000, but owing to unfortunate financial dealings, he lost all his wealth and died a pauper.

Daniel Baird Wesson, the well-known revolver manufacturer, died at his home in Springfield, Mass., on August 4, after an illness extending over almost four years. He was the founder of the firm of Smith & Wesson and manufactured guns and revolvers the greater part of his life. Mr. Wesson was born in Worcester in 1825, and went to Springfield in 1857 and founded the firm which bears his name. His wealth is estimated at present at $50,000,000. He is survived by two sons, a daughter and thirteen grandchildren.

P. H. Laufman, of Pittsburg, one of the pioneer steel manufacturers of this country and early interested in the production of tin plate, died at his winter home in Southern Pines, S. C., Monday, August 6, at an advanced age. Mr. Laufman's father was an iron maker in the Cumberland valley. The son removed to Pittsburg in 1840, and a little later began the manufacture of hardware. He organized the firm of P. H. Laufman & Co. and began the manufacture of tin plate in 1888. He retired from business after selling his mills to the American Sheet Steel Co., now one of the subsidiary companies of the United States Steel Corporation. Three daughters and a son survive him.

NEW RANGE ACTIVITY

Shown in Statistics.—Old Ranges Are Falling Behind.

(Staff Correspondence.)

Duluth, August 6.—Just how big a month July has been at the head of the lakes in the matter of ore shipments is shown by the accompanying record and comparison of the figures for the past month.

The figures show that July was ahead of any previous period of the same length and that the total shipments from the Vermillion and Mesabi ranges are 1,067,837 in advance of last year's record. This is 102,143 more than the gain in the total carried down the lakes, as the lower ranges in the aggregate have not been holding their own.

A deal has just been consummated in this city between the Shagawa Iron Co. and the Midland Steel Co., whose plant is thirty-one miles below Pittsburg. The transactions were carried on through Alex. Hamfield, representing the Midland Steel Co. in Duluth. The property leased is a part of the holdings of the Shagawa Iron Co. in Sec. 30, 63-11 and has been worked to the extent of driving a shaft and a couple of drifts by the fee owners, A. M. Chisholm, D. M. Philbin and Edward Lynch. The terms of the transfer are not to be made public. The ore is similar in nature to the other Vermillion range deposits and will be a mixture of hard and soft grades.

On August 1 the resignation of A. H. Viele, vice president, general passenger and freight agent and auditor of the Duluth & Iron Range railway, was received and accepted. Horace Johnson, formerly secretary, was appointed to fill the position of general passenger and freight agent and auditor, but the position of vice president has not been arranged for as yet. Carroll F. Graff will take Mr. Johnson's place as secretary.

	Two Harbors.	Duluth.	Superior.	Total.
July 21-31, '06	431,930	584,860	296,848	1,313,638
July 21-31, '05	405,756	440,174	258,270	1,104,200
Increase	26,174	144,686	38,578	209,438
July, 1906	1,288,625	1,783,086	917,761	3,989,472
July, 1905	1,210,916	1,394,828	885,588	3,491,332
Increase	77,709	388,258	32,173	498,140
June, 1906	1,176,982	1,656,831	885,588	3,719,401
Increase	111,643	126,255	32,173	270,071
Total to Aug. 1, 1906	3,865,153	4,932,508	2,671,536	11,469,197
Total to Aug. 1, 1905	3,766,993	4,114,376	2,519,991	10,401,360
Increase	98,160	818,132	151,545	1,067,837

LATE RAIL SALES.

(Special Telegram.)

New York, Aug. 8.—Seaboard Air Line 24,000 tons; Southern railway, 15,000 tons with more pending; Miscellaneous, 6,000 tons, all for 1907 delivery. For 1906 delivery there have been only scattered lots aggregating 6,000 tons.

PRODUCTION OF PIG IRON IN THE UNITED STATES IN THE FIRST SIX MONTHS OF 1906.

Statistics collected from the Manufacturers by The American Iron and Steel Association, all in Gross Tons.

Production in the first half of 1905, 11,163,175 Gross Tons; second half of 1905, 11,829,205 Tons; first half of 1906, 12,602,901 Tons.

Total Production of All Kinds of Pig Iron.

TOTAL PRODUCTION OF PIG IRON BY STATES.

States.	Blast Furnaces. In blast Dec. 31, 1905.	June 30, 1906. In.	Out.	Total.	Production. Gross tons of 2,240 pounds. (Includes spiegeleisen and ferro-manganese.) First half of 1905.	Second half of 1905.	First half of 1906.
Massachusetts	1	1	1	2	7,636	8,351	10,218
Connecticut	3	2	1	3			
New York	14	18	7	25	550,208	647,860	746,271
New Jersey	5	8	3	11	165,991	145,048	167,820
Pennsylvania	126	130	22	152	5,226,691	5,352,436	5,688,743
Maryland	4	4	2	6	156,334	175,762	194,907
Virginia	14	14	12	26	240,672	260,538	257,806
North Carolina	0	0	1	1	25,752	12,947	46,865
Georgia	3	3	1	4			
Texas	0	1	3	4			
Alabama	30	26	22	48	743,547	860,515	830,040
West Virginia	4	3	1	4	149,016	149,163	136,662
Kentucky	3	4	5	9	32,793	30,942	35,533
Tennessee	12	14	7	21	195,757	176,935	204,043
Ohio	55	53	11	64	2,181,058	2,405,052	2,675,812
Illinois	17	20	2	22	979,157	1,055,326	1,011,639
Michigan	9	10	1	11	147,953	140,751	190,899
Wisconsin	6	5	1	6	184,234	167,181	190,949
Minnesota	1	1	0	1			
Missouri	2	2	0	2			
Colorado	4	4	1	5	176,376	231,398	214,694
Oregon	0	0	1	1			
Washington	0	0	1	1			
Total	313	323	106	429	11,163,175	11,829,205	12,602,901

PRODUCTION OF BITUMINOUS COAL AND COKE PIG IRON.

New York	13	17	0	17	499,900	611,985	742,949
New Jersey	1	3	1	4	126,644	80,151	113,523
Pennsylvania	84	96	5	101	4,483,282	4,607,459	4,981,814
Maryland	4	4	1	5	156,108	175,762	193,498
Virginia	13	13	9	22	259,399	268,637	293,124
North Carolina	0	0	1	1			
Georgia	0	1	0	1			
Texas	0	1	0	1			
Alabama	29	24	19	43	729,845	848,669	819,390
West Virginia	4	3	1	4	149,016	149,163	136,662
Kentucky	2	3	5	8	32,793	30,588	34,580
Tennessee	11	13	5	18	195,180	175,037	203,509
Ohio	53	51	6	57	2,180,558	2,401,377	2,674,137
Illinois	17	20	2	22	979,157	1,055,326	1,011,639
Michigan	0	1	0	1	182,415	149,642	190,900
Wisconsin	5	4	1	5			
Minnesota	1	1	0	1	188,191	248,653	235,932
Missouri	1	1	0	1			
Colorado	4	4	1	5			
Total	242	260	57	317	10,162,488	10,802,449	11,631,657

ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

New York	1	1	5	6	88,651	100,772	57,619
New Jersey	4	5	2	7			
Pennsylvania	41	32	15	47	741,524	743,568	705,903
Total	46	38	22	60	830,175	844,340	763,522

PRODUCTION OF CHARCOAL PIG IRON BY STATES.

Massachusetts	1	1	1	2	8,640	8,351	10,218
Connecticut	3	2	1	3			
New York	0	0	2	2			
Pennsylvania	1	2	2	4	1,885	1,409	1,026
Maryland	0	0	1	1	1,125	946	2,727
Virginia	1	1	3	4			
Alabama	1	2	3	5	13,702	11,846	10,650
Georgia	3	1	1	2	6,703	15,154	8,129
Texas	0	0	3	3			
Kentucky	1	1	0	1			
Tennessee	1	1	2	3			
Ohio	2	2	5	7	500	3,675	1,675
Michigan	9	9	1	10	104,584	105,989	137,031
Wisconsin	1	1	0	1	33,373	35,046	32,679
Missouri	1	1	0	1			
Oregon	0	0	1	1			
Washington	0	0	1	1			
Total	25	24	27	51	170,512	182,416	204,135

PRODUCTION OF MIXED CHARCOAL AND COKE PIG IRON.

Georgia	0	1	0	1			3,587

TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

Bituminous	242	260	57	317	10,162,488	10,802,449	11,631,657
Anthracite	46	38	22	60	830,175	844,340	763,522
Charcoal	25	24	27	51	170,512	182,416	204,135
Charcoal and coke	0	1	0	1			3,587
Total	313	323	106	429	11,163,175	11,829,205	12,602,901

Miscellaneous Pig Iron Statistics.

PRODUCTION OF PIG IRON IN PENNSYLVANIA AND OHIO.

	Districts.	Blast Furnaces. In blast Dec. 31, 1905.	June 30, 1906. In.	Out.	Total.	Production. Gross tons of 2,240 pounds. (Includes spiegeleisen and ferro-manganese.) First half of 1905.	Second half of 1905.	First half of 1906.
Pennsylvania.	Lehigh Valley	19	19	7	26	316,721	309,579	333,179
	Schuylkill "	12	13	3	16	290,266	263,428	352,599
	L. Susq. "	15	14	5	19	282,967	381,812	334,526
	Juniata "	6	5	5	10	107,723	102,046	106,794
	Allegheny Co.	40	42	0	42	2,716,668	2,694,222	2,856,327
	Shenan. Valley	19	20	0	20	882,834	906,182	1,026,306
	Miscel. bitum.	14	15	0	15	627,627	693,758	677,986
	Charcoal	1	2	2	4	1,885	1,409	1,026
Ohio.	Mahoning Val.	16	15	1	16	855,336	869,591	949,222
	Hocking "	1	1	0	1	558,092	742,355	744,139
	Lake Counties	11	11	1	12			
	Miscel. bitum.	15	15	1	16	594,140	603,898	774,734
	H. R. bitum.	10	9	3	12	172,990	185,533	206,042
	H. R. charcoal	2	2	5	7	500	3,675	1,675

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

New York and New Jersey	239,525	297,412	376,271
Pennsylvania	2,955,978	2,983,064	3,220,655
Maryland	156,108	175,762	193,498
West Virginia, Tennessee, and Kentucky	153,857	161,843	141,741
Ohio	1,506,334	1,701,459	1,971,409
Illinois	796,763	859,517	817,182
Michigan and Wisconsin	36,629	55,044	61,310
Colorado	139,954	187,867	117,000
Total	5,985,148	6,421,968	6,899,066

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON IN PENNSYLVANIA AND OHIO BY DISTRICTS.

Pennsylvania.	Lehigh Valley	55,535	55,817	67,122
	Schuylkill Valley			
	Lower Susquehanna Valley	218,057	300,570	267,184
	Juniata Valley			
	Allegheny County	1,865,597	1,783,150	1,904,927
	Shenango Valley	585,501	536,409	712,010
	Miscellaneous bituminous	231,288	307,118	269,412
Ohio.	Mahoning Valley	593,859	619,157	754,662
	Hocking Valley			
	Lake Counties	417,023	587,271	601,843
	Hanging Rock bituminous	59,736	75,738	73,849
	Miscellaneous bituminous	435,716	419,293	541,055

PRODUCTION OF BASIC PIG IRON, NOT INCLUDING CHARCOAL IRON.

New York and New Jersey	92,939	79,267	118,536
Pennsylvania—Allegheny County	753,449	784,460	845,780
Other counties	657,930	762,167	831,351
Virginia and Alabama	201,524	246,963	267,379
Ohio, Illinois, Missouri, and Colorado	260,750	265,730	386,229
Total	1,966,592	2,138,587	2,449,275

PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

Pennsylvania	81,829	107,939	105,117
New Jersey, Illinois, and Colorado	43,505	56,710	55,716
Total	125,334	164,649	160,833

PRODUCTION OF ALL KINDS OF PIG IRON FROM 1901 TO 1905.

States.	Gross tons of 2,240 pounds. 1901.	1902.	1903.	1904.	1905.
Massachusetts	3,386	3,360	3,265	3,149	15,987
Connecticut	8,442	12,086	14,501	8,922	
New York	283,662	401,369	552,917	605,709	1,198,068
New Jersey	155,746	191,380	211,667	262,294	311,039
Pennsylvania	7,343,257	8,117,800	8,211,500	7,644,321	10,579,127
Maryland	303,186	303,229	324,570	293,441	332,096
Virginia	448,662	537,216	544,034	310,526	510,210
North Carolina, Georgia, Texas	29,606	35,410	87,255	75,686	38,099
Alabama	1,225,212	1,472,211	1,561,398	1,453,513	1,604,062
West Virginia	166,597	183,005	199,013	270,945	298,179
Kentucky	68,462	110,725	102,441	37,106	63,735
Tennessee	337,139	392,778	418,368	302,096	372,692
Ohio	3,326,425	3,631,388	3,287,434	2,977,929	4,586,110
Illinois	1,596,850	1,730,220	1,692,375	1,655,991	2,034,483
Michigan	170,762	155,213	244,709	233,225	288,704
Wisconsin, Minnesota	207,551	273,987	283,516	210,404	351,415
Missouri, Colorado, Washington	203,409	269,930	270,289	151,776	407,774
Total	15,878,354	17,821,307	18,009,252	16,497,033	22,992,380

Wall Street Does Not Reflect Prosperity.

The principal topic of discussion on the stock market during the past week was the unexpected declaration of a dividend on United States Steel common. Although the effect was electrifying for a short time, Wall street did not reflect industrial conditions, for a number of stocks, which have been level despite the heavy realizing sales in Russian securities. At New York the bulls were uncommonly prominent and the first three days of August were recorded as three "million-share days," as compared with two during the entire month of July. Apropos of present conditions the New York *Evening Post* of August 4 says:

"There seems to be no rift in the lute so far as concerns the visible movement of prosperity. To our very nearly unprecedented wheat and corn crop promise is now added, by this week's government report, a cotton crop indication second only to that of 1904. Whatever our financial extravagances and excesses, it must be said that the United States is a lucky country."

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. July 28	Closing Quotation Aug. 4	Changes	Date of 1906 Ann. Meet.	Par Value	Capital Outstanding	Dividend Basis	Dividend Being Paid	Dividend Date Last Div. Pay.
Allis-Chalmers Co	18	17⅛	− ⅛	Sept.	100	19,820,000	.....	.....	.....
Allis-Chalmers preferred	49¼	49	− ¼		100	16,150,000	7 cum	.....	Feb., 1904
American Can	7	7⅛	+ ⅛	Apr. 24	100	41,233,300	.....	.....	.....
American Can preferred	54½	59⅛	+4⅜		100	41,233,300	7 cum	5 Q.	July, 1906
American Car and Foundry	37¾	37¾	.....	June 28	100	30,000,000	.....	.....	May, 1905
AmericanCar and Foundry preferred	100⅛	100⅛	.....		100	30,000,000	7 n. c.	7 Q.	July, 1906
American Locomotive	72¾	68¾	−3⅛	Oct. 16	100	25,000,000	.....	1¾	July, 1906
American Locomotive preferred	114	113⅛	− ⅛		100	24,100,000	7 cum	7 Q.	July, 1906
American Shipbuilding	65½	53½	− 10	Oct. 2	100	7,600,000	4 n. c.	1 Q.	Aug. 1906
American Shipbuilding preferred	106¾	106	− ¾		100	7,900,000	7 n. c.	1¾ Q.	Aug. 1906
American Steel Foundries	11⅝	11⅜	+ ⅛	Oct. 3	100	17,700,000	.....	.....	.....
American Steel Foundries preferred	44	45¾	+1¾		100	17,700,000	6 cum	.....	Aug., 1905
Barney & Smith	65	65	.....	June 5	100	1,000,000	.....	.....	June, 1894
Barney & Smith preferred	135	135	.....		100	2,500,000	8 cum	8 Q.	June 1906
Bethlehem Steel	22	22¾	+ ¾	April 3	100	15,000,000	.....	.....	.....
Bethlehem Steel preferred	86	85	−1		100	15,000,000	7 n. c.	7 Q.	Aug ,1906
Bullock Electric preferred	111	111	.....	Oct. 2	100	1,000,000	6	6 Q.	July, 1906
Cambria Steel	34⅞	34¼	− ⅝	March 20	50	45,000,000	6	3 Q.	Aug., 1906
Cambria Iron	49½	49½	.....		50	8,468,000	4	4 S. A.	Apr., 1906
Colorado Fuel & Iron	54¼	51⅞	−2⅜	Oct. 15	100	30,132,000	7	.....	Apr., 1902
Wm. Cramp & Sons Ship & Eng. Bldg. Co.	18	18	.....	May 31	100	6,098,000	5	.....	Nov., 1902
Crucible Steel	12	12⅜	+ ⅜	Oct. 17	100	25,000,000	.....	.....	.....
Crucible Steel preferred	78	77	−1		100	25,000,000	7 cum	.....	June, 1906
Empire Steel	7	5	−2	Feb. 28	100	2,281,400	.....	.....	.....
Empire Steel preferred	38	35	−3		100	2,500,000	6 cum	3 S. A.	July, 1906
Fay & Egan	93½	93½	.....	Feb. 20	100	1,000,000	6	6 Q.	May, 1906
Fay & Egan preferred	128½	128½	.....		100	1,000,000	7 cum	7 Q.	May, 1906
General Electric	167¾	167	− ¾	May 8	100	48,256,050	8	8 Q.	July, 1906
International Pump	47	45	−2	June 5	100	12,362,500	.....	2	July, 1905
International Pump preferred	86	80	−6		100	8,850,000	6 cum	6 Q.	Aug., 1906
Lackawanna Steel	65	65	.....	March 14	100	34,971,400	.....	.....	.....
Lake Superior Corporation	17	17	.....	Oct. 3	100	40,000,000	.....	.....	.....
Niles-Bement-Pond	130	130	.....	Feb. 7	100	5,000,000	8	6 Q.	May, 1906
Niles-Bement-Pond preferred	105	105	.....		100	2,000,000	6 cum	6 Q.	June, 1906
Otis Elevator Co	46	46	.....	March 19	100	6,350,300	.....	2 A.	Apr., 1906
Otis Elevator Co. preferred	96	96	.....		100	5,589,500	6 n. c.	6 Q.	July, 1906
Pittsburg Coal Co	13¾	15	+1⅜	Feb. 12	100	30,135,000	.....	.....	.....
Pittsburg Coal preferred	53¾	53	− ¾		100	30,716,200	7	.....	Apr., 1905
Pressed Steel Car	49⅝	51	+1⅜	Feb. 21	100	12,500,000	3	3	Aug., 1904
Pressed Steel Car preferred	99	99	.....		100	12,500,000	7 n. c.	7 Q.	Aug., 1906
Pullman Palace Car	224	238	+14	Oct. 18	100	74,000,000	.....	8 Q.	Aug., 1906
Railway Steel Spring	52⅞	52¼	+ ⅜	March 1	100	13,500,000	.....	4 S. A.	Oct., 1905
Railway Steel Spring preferred	99¾	99¼	− ½		100	13,500,000	7 cum	7 Q.	June, 1906
Republic Iron & Steel	29	28	−1	Oct. 17	100	27,352,000	.....	.....	.....
Republic Iron & Steel preferred	99¼	98⅜	− ¾		100	20 852,000	7 cum	7 Q.	Apr., 1906
Sloss-Sheffield	75½	76	+1½	March 14	100	7,500,000	5	5	Jan., 1906
Sloss-Sheffield preferred	106	106	.....		100	6,700,000	7 n. c.	7 Q.	July, 1906
Tennessee Coal & Iron	154¾	154	− ¾	May 15	100	22,552,800	.....	4 Q.	Aug., 1906
U. S. Cast Iron Pipe & Foundry	49⅛	48	−1⅛	June 27	100	12,500,000	.....	2	Sept., 1906
U. S. Cast Iron Pipe & Foundry preferred	93	92¼	− ¾		100	12,500,000	7 n. c.	7	Sept., 1906
U. S. Steel	39⅛	39⅛	.....	April 16	100	508,302,500	2 n. c.	½ Q.	Oct., 1906
U. S. Steel preferred	106½	106⅝	+ ⅛		100	360,281,100	7 cum	7 Q.	May, 1906
U. S. Steel 5's	98½	98½	.....		100	463,798,000	5	5 A.	.....
Virginia Iron, Coal & Coke	40⅞	44⅛	+3⅜	Sept. 18	100	8,641,600	.....	.....	.....
Westinghouse Electric	152	150¾	−1¼	June 27	50	20,996,350	10	10 Q.	July, 1906
Westinghouse Air Brake	145½	145	− ½	Oct. 2	50	10,990,450	20	20 Q.	July, 1906

boosted of late, owing to the overwhelming bullish sentiment, fell several points shortly after the dividend news arrived. Steel itself, which sold at 41½, went down two points in the next two days, instead of rising. This effect was probably due to the natural results of over-bought conditions. Certain it is, however, that there was a decided recession in prices from the levels to which clever manipulation had carried them the first part of the week. On the other side of the ocean the markets were active and generally firm, with American stocks holding strong at London. At Paris the market opened firm and closed at a high

Directors of the American Radiator Co., declared the regular quarterly dividend of 1¾ per cent on common. The preferred dividend is payable Aug. 15 to stockholders of record Aug. 8. The common dividend is payable Sept. 29 to stockholders of record Sept. 22.

Small Number of Failures.—Commercial failures in the United States during the month of July, according to statistics compiled by R. G. Dun & Co., were 738 in number and $6,919,014 in amount of defaulted indebtedness. This is the best exhibit as to number for the month of July in any recent year, and, while the amount of liabilities was somewhat larger than in July, 1905, no other year of the preceding decade made as good a showing, except 1899. In the corresponding month last year there were 786 failures, involving $6,148,930. Manufacturing insolvencies last month numbered 144, with liabilities of $2,761,640, against 173 failures in the same month last year, when the amount of indebtedness was $3,519,739.

HEARTY WELCOME TO AMERICAN ENGINEERS.

JOINT MEETING OF GREAT SOCIETIES IN LONDON.

Members of the Iron and Steel Institute and American Institute of Mining Engineers Discuss Important Subjects.—Cablegram to John Fitz.—Greetings from Carnegie.

(Special Correspondence.)

London, July 28.—The summer meeting of the Iron and Steel Institute was held in London during the week commencing July 23 and proved in many ways a memorable gathering. The meeting place was the handsome suite of rooms occupied by the Instiution of Civil Engineers, Great George street, Westminster. The rooms are admirably fitted for such a gathering, but the feature of the summer meeting was the large attendance of Americans who paid a return visit to the old country. The British members several times during the opening proceedings expressed their warm appreciation of the ample arrangements made for their pleasure on each occasion when the institute has visited America, and a strong effort was made to reciprocate this good feeling by the arrangement of an extensive round of visits and entertainments. The meeting was favored with brilliant summer weather, which greatly added to the enjoyment. The lecture hall was well filled at the inaugural meeting on Tuesday morning, but a large number had already enjoyed the hospitality of the president at a reception given by Mr. and Mrs. R. A. Hadfield at the Grafton Galleries on Monday evening.

The chairman presided, and the place of honor at his left hand was given to Mr. Robert W. Hunt, of Chicago, several members of the council occupying places at the principal table. The councillors and leading members of the institute present were: Mr. G. Ainsworth (Consett), Sir J. P. A. Alleyne, Bart. (vice president), Sir Hugh Bell, Bart., Mr. W. H. Bleckly, treasurer, Mr. F. Cleeves, Mr. David Colville, and Messrs. A. Cooper, J. Von Ehrenwerth (Leoben), W. Evans, J. M. Gledhill, A. Griener, Rt. Hon. Sir James Kitson (past president), E. P. Martin (past president), E. W. Richards (past president), J. E. Stead, A. Tannett, J. M. While, W. Whitwell (past president), Sir Alfred Hickman, Sir Lloyd Wise, A. Keen, Prof. LeChatiler, Prof. Turner and many other leading ironmasters with Mr. Bennett B. Brough, secretary.

The American contingent, which was very numerous, was as follows, the names of the ladies accompanying the members being shown in brackets:

W. Affleck, Ellsworth, Pa.
Hugh A. Bain, (Mrs. Bain), Riverside, Cal.
David Baker, Philadelphia, Pa.
George D. Barron, (Mrs. Barron and the Misses Dorothy and Helena Barron), Rye, N. Y.
Dr. Robert Bell, (Mrs. Bell), Toronto, Ont.
Victor M. Braschi, (Mrs. Braschi), Mexico City, Mex.
Frank J. Campbell, (Mrs. Campbell), Denver, Colo.
A. E. Carlton, (Mrs. Carlton), New York.
Charles Catlett, (Mrs. Catlett and Miss Catlett), Staunton, Va.

H. R. H. EDWARD VII.

LADY MAYORESS OF LONDON.

LORD MAYOR OF LONDON.

OFFICIALS WHO RECEIVED THE ENGINEERS.

H. S. Chamberlain, (Mrs. Chamberlain), Chattanooga, Tenn.
A. Ladd Colby, (Mrs. Colby), New York.
T. C. Crane, (Mrs. Crane), Philadelphia, Pa.
W. H. Crawford, Nashville, Tenn.
C. M. Davidson, (Mrs. Davidson), Chicago, Ill.
C. E. Dinkey, (Mrs. Dinkey), Braddock, Pa.
W. H. Donner, Pittsburg, Pa.
Theodore Dwight, New York.
J. W. Elsworthy, New York.
B. F. Fackenthall Jr., (Mrs. Fackenthall), Easton, Pa.
H. P. Fogh, (Mrs. Fogh), Seattle, Wash.
Paul R. Forbes, Boston, Mass.
J. Hartshorn, Pottstown, Pa.
G. C. Hewett, Colorado Springs, Colo.
B. G. Hills, (Mrs. Hills), Colorado Springs, Colo.
F. Howald, Columbus, O.
Alex. C. Humphreys, New York.
R. W. Hunt, (Mrs. Hunt), Chicago, Ill.
E. S. Hutchinson, Newton, Pa.
G. N. Geppson, Worcester, Mass.
G. T. Kern, (Mrs. Kern), Worcester, Mass.
Julian Kennedy, (Mrs. Kennedy and Miss Kennedy), Pittsburg, Pa.
Prof. William Kent, (Mrs. Kent and Miss Kent), Syracuse, N. Y.
Paul S. King, New York.
C. Kirchhoff, (Miss Kirchhoff), New York.
J. Langeloth, (Mrs. Langeloth), New York.
J. H. Lee, (Mrs. Lee, Miss Towers and Miss Wallace), Baltimore, Md.

E. C. Leonard, Albany, N. Y.
R. W. Lodge, (Mrs. Lodge), Boston, Mass.
J. J. McDonald, (Mrs. McDonald), Truinfo, Cal.
E. J. McCaustland, Ithaca, N. Y.
C. McCrery, Birmingham, Ala.
G. Mesta, Pittsburg, Pa.
R. H. Norton, (Mrs. Norton and the Misses M. R. and V. R. Norton), Los Angeles, Cal.
Paul A. Radu, Los Angeles, Cal.
G. Ormrod, (Mrs. Ormrod and Miss Mary A. Ormrod), Allentown, Pa.
T. C. Patterson, Pittsburg, Pa.
E. Bernheim, Pittsburg, Pa.
R. Pearce, Denver, Colo.
W. H. Peirce, Baltimore, Md.
R. Peters, (Mrs. Peters), Philadelphia, Pa.
N. P. Black, (the Misses N. H. and L. K. Black), Philadelphia, Pa.
S. H. Pitkin, (Mrs. Pitkin), Akron, Ohio.
S. N. Pitman, (Mrs. Pitman and Miss Pitman), Providence, R. I.
A. L. Queneau, (Mrs. Queneau), South Bethlehem, Pa.
R. W. Raymond, Secretary, American Institute of Mining Engineers, New York.
J. P. Roe, (Mrs. Roe and the Misses Josephine and Nancy Roe), Pottstown, Pa.
D. P. Rohlfing, (Mrs. Rohlfing), Salt Lake City, Utah.
A. Sauveur, Cambridge, Mass.
E. Skewes, Ontario, Can.
J. William Smith, (Mrs. Smith, the Misses A. and W. Smith and Mr. E. M. Smith), Syracuse, N. Y.
Oberlin Smith, (Mrs. Smith, Miss Smith and Miss Alice Hill), Bridgton, N. J.
J. Struthers, New York.
K. Taylor, (Mrs. Taylor), High Bridge, N. J.
L. H. Taylor Jr., Philadelphia, Pa.
W. Thompson, (Mrs. Thompson), Chihuahua, Mex.
H. A. Titcomb, Newton, Pa.
C. C. Titcomb, Newton, Pa.
J. F. Vaile, Denver, Colo.
A. E. Vaughan, Brooklyn, N. Y.
C. E. Wait, (Mrs. Wait and Miss H. Porter), Knoxville, Tenn.
C. E. Wait Jr., Knoxville, Tenn.
J. D. Bruce, Knoxville, Tenn.
E. H. White, Cambridge, Mass.
N. R. Wilson, Monterey, Mex.
W. Wood, Philadelphia, Pa.
J. E. York, (Mrs. York), Brooklyn, N. Y.
H. P. York, Brooklyn, N. Y.

President Hadfield offered a most hearty and cordial welcome to the members of the American Institute of Mining Engineers, remarking that everyone in Great Britain interested in iron and steel joined with him. They felt the greatest satisfaction that many of their American friends had been able to attend the important international meeting in the great metropolis. Devoted as they were to the study of iron they could not forget the deep significance of the metallurgists of two great industrial powers, mother and daughter, drawing together in mutual respect. Such gatherings were of the utmost international importance.

Continuing, the president said the good feeling between England and America grew stronger each year, and Gen. Sherman fifteen years ago said, "If ever there is a 'shindy' on this side of the water, America will not sit by, but will come over and help." The general added "I feel no difference in this hall between an assembly of Englishmen and Americans." The remark had still greater force today.

Their difficulty in arranging for the comfort and pleasure of the visitors arose from the numerous offers of help, and as indicating the enthusiasm in connection with the arrangements no less than 5,000 letters bearing upon the meeting had been dealt with by the secretary, Mr. Brough (applause), to whom they were exceedingly indebted for the able way in which he had managed the arrangements regarding the whole visit. He had treated the matter not merely as routine work, but as a labor of love. The speaker proceeded to acknowledge the great help received in the arrangements from Sir James Kitson, Sir Hugh Bell, the Lord Mayor of London, Sir Lloyd Wise, and others. He added:

"Although, greatly to my personal regret, I was unable to be present on the second visit of this institute to your country, I shall never forget the hospitality you showered upon us in 1890, and how willingly the hand of friendship was held out to us on every occasion."

Deaths of the Year.

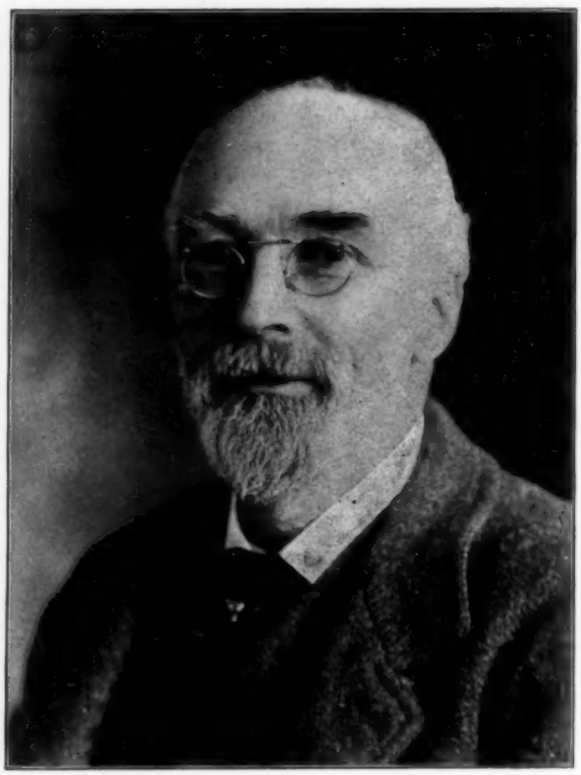
Recalling the losses of the year, Mr. Hadfield said they would all join in mourning the absence of those bearing such household names in metallurgy as Sir Lowthian Bell, Sir Bernard Samuelson, Sir E. Carbutt, Sir David Dale, and Mr. Snelus. Professor Howe's biographical masterpiece concerning Sir Lowthian Bell demanded their grateful thanks. Never were truer and more eloquent words written. They would, on the other hand, share their satisfaction in having with them the father of their institute, Sir John Alleyne, and Mr. J. D. Ellis, now over 84 years of age, with Sir James Kitson, who so worthily sustained the dignity of his country and the renown of the Cosmopolitan Institute during those memorable trips of 1890 and 1904. (Applause.)

The speaker continued:

"You yourself have reason to be proud in still having with you Mr. John Fritz, the nestor of the American iron trade, now, I believe, within a month of completing his 84th year; we greatly regret he cannot be with us today. As he is one of our Bessemer medalists and honorary members, I suggest we send to him this cablegram, in united friendly greeting. Every English member and every American will join me in these words:

" 'This great and memorable gathering of Englishmen and Americans united send you, Bessemer medalist and honorary member of the Iron and Steel Institute, heartiest and most friendly greetings. We congratulate you upon the immense progress in metallurgy made during your lifetime, and in which you have played so honorable a part. Long may you be spared to us.'

"I will conclude these personal references by saying how much this institute has been indebted to our late president, Mr. Andrew Carnegie, who, notwithstanding rumors to the contrary, is still on the sunny side of seventy. We are delighted to have had him as our presi-



SIR HUGH BELL, THE NEW PRESIDENT OF THE IRON AND STEEL INSTITUTE.

dent, and we are proud that he, an American, occupied the presidential chair, the first to do so not a British citizen. In a personal letter to myself, he writes:

"'It is a matter of deep disappointment and regret that I am prevented from joining you in London, and doing what I could, if anything, to aid and support you in your duties. That you will all render memorable the forthcoming visit of the American societies, I feel confident. It would have been a great pleasure to me to appear in my international capacity of British-American, taking each of the two sections by the hand and joining them together in bonds of lasting friendship. With every good wish for one and all.' "

The San Francisco Calamity.

Proceeding, the president referred in eloquent terms to the terrible calamity at San Francisco, one of the most beautiful of American cities, involving a monetary loss estimated at three hundred million dollars. Never did a greater wave of sympathy run through great Britain and Ireland than when that news was received. But the citizens of America had risen nobly to a situation almost unparalleled in history. They congratulated them, but might they not also congratulate themselves on that further proof of the Anglo-Saxon being able to surmount any difficulties that might be their lot to meet with in this mundane sphere. Every member of the institute and every Englishman would wish San Francisco not only freedom from those terrible visitations, but that she might arise literally from her ashes stronger and more powerful than ever before.

The speaker continued:

"I do not know whether all present have seen that remarkable photograph of Kohl building in San Francisco, representing one of the few buildings which was not destroyed by either shock or fire. There it stands, tall and unscathed, in the midst of a scene of terrible devastation, the American flag flying proudly from its garden roof, as if to show the world that the citizens of San Francisco were undaunted, even though they had passed through one of the greatest disasters of modern times. All honor to a country which has produced such a city and such citizens."

Mr. Hadfield went on to express his satisfaction at the increasingly important position occupied in the world's progress by technical men, among whom not the least were the specialists in metallurgy. For the first time in the world's history the science had been recognized from the

W. ROXBROUGH.

T. J. COOK.

academical point of view, for the University of Sheffield under its newly formed charter now conferred the degrees of doctor, master and bachelor of metallurgy.

Going next into figures, the speaker recalled that on the first British visit to America in 1890, that country had commenced to pass Great Britain in its production of pig iron, making what must seem now the modest total of about nine million tons against eight million tons in Great Britain. American imports and exports were then about 300 million sterling against Great Britain's 684 million sterling. Today, the American productions had reached the enormous figure of about 23 million tons, and Englishmen were almost startled by the American proposals for the Gary plant involving an expenditure of over £15,000,000, and including eighty 60-ton basic open-

THOMAS MC FARLAND.

hearth furnaces. He heartily congratulated them, as in the advancing and prosperity of one country the world generally must benefit. English members of the institute would join in that expression of opinion, as they knew that much of that remarkable progress had been brought about by the members of the American Institute of Mining Engineers.

Sir James Kitson's Welcome.

Sir James Kitson also added a few words of welcome. He said, if they would look at the program, they would see he had the melancholy distinction of being the senior past president of the institute. (Laughter.) For a long time their distinguished president, Sir Lowthian Bell, had held that position and he was glad to know that he was to be followed in the support of the institute by his talented son whose services they hoped to utilize for their general advantage. The disappearance of Sir Bernard Samuelson and Sir David Bell left him in the position which he hoped he should long enjoy of being the senior vice president. (Laughter and applause.) It was fitting that he should add just a few words to the eloquent period of their president in welcoming their American friends to England. He remembered in their great visit of 1890 to the United States, when he had the honor of being president, leading a magnificent body of English iron manufacturers and engineers from New York through the states, and he was referred to by Mr. Abraham Hewitt as a representative of a fossil manufacture. (Laughter.) The fossil he referred to was best Yorkshire iron. He said it might be found here and there in the annals of engineers as a curious relic of high quality iron. The

C. E. CORSON.

speaker remarked amid laughter. "Well, you have seen me, gentlemen, I venture to say we are still going, how strongly we may be going I ask you to judge, by the sample which is before you. But when you come here to see our fossils and our remains you will find that the iron and steel strain also, like the sample, is still going strong in the old country. Although we cannot rival those colossal figures which you are able to give us, yet we are able to show Great Britain at this moment as a great manufacturer of iron and steel and producing more metal and more coal for the purposes of industry than it has ever done in the history of the world. That is something for a fossil to be able to show to your Americans. When you come over here to our country you are in the habit of saying 'Shakespeare is not yours, Shakespeare is ours, he is a man of Anglo-Saxon race,' and you are in the habit of saying 'Your Westminster Abbey and your great ruins are not yours, they are ours, they are enjoyed by the whole Angle-Saxon race.' (Applause.) Well, when you come here to visit these works of ours and these great objects which we are going to show you, at any rate for the day for the week, and the month, they are not ours—they are yours. (Applause.) You are entering upon your own domain of enjoyment and possession and all we can do shall be done to make your stay here a happy, and, I hope, a useful one." (Applause.)

Capt. Hunt's Speech.

The chairman then called upon Capt. Hunt, of America, whom he referred to as their chief guest, suggesting that they should receive him in true English fashion, with the resounding and rhythmic clapping known as Kentish fire, a suggestion which was heartily responded to.

Mr. Hunt remarked that while he had lived a great many years and might lay claim to the compliments offered, yet he had never before been received with that kind of fire from Kent. But he was proud to say that his ancestors came from England. He would see if he could locate them in that particular locality of Kent. He acknowledged very warmly the heartiness of the reception given to the Americans, and what his voice would not convey, he asked his hearers to believe, existed in his heart. The president's comprehensive and eloquent address would certainly be appreciated by all of them and they only wished they could feel worthy of the flattering things that had been said. The affectionate allusions made to those members venerated by Americans was very deeply felt by all of them. But what

DR. WILLIAM KENT.

touched them most was that, dear Uncle John Fritz would have one of the happiest days of his life in the receipt of that cablegram. He thought that though they were away from home they might claim this as their home. But having been away from the English home, they might, as absentees were fond of doing, tell what they had been doing during their absence. But it did sometimes happen that that which was told was more interesting to themselves than to their listeners. (Laughter.) If therefore, during their visit some of them told something to their English friends which might better be left unsaid, and might appear to be somewhat elevated in texture, their English friends much bear with them, and appreciate the fact that living in a country of those great distances which had been referred to, it was almost an impossibility to contract their speech. (Loud laughter.) But no matter to what extent they might go in their expressions, no words would be big enough or strong enough to give expression to what they all felt in regard to the magnificent reception and the warm hospitality they were enjoying. If the American Institute of Mining Engineers have ever had any happy days in its existence, they were certainly on the occasions when the institute had the opportunity of welcoming the Englishmen and their organizations to America. In fact, they almost felt that they were part of the Iron and Steel Institute, and it was certainly the success of that organization which led to the establishment of its American contemporary, which was built largely on the lines of the older body. It was comprehensive in its character, and in its membership, and they hoped in a small way it was performing good work upon the same lines (hear, hear). They could not claim such old organizations or such old industries as the president had alluded to; therefore they must base their claim and their pride upon newer things. It was also true that in every one of those new things they had for their foundation the ideas obtained from the other side of the water (hear, hear). At the same time, they would not be worthy to be the offspring of Great Britain if they had been contented simply to receive those ideas without trying to expand and develop them; and therefore, if the Americans had done anything worthy of praise in America, Englishmen must please appreciate the fact that Americans had only carried to a greater point of perfection perhaps, or at least, of production, those ideas which had been given to them from Great Britain. He would not take the time of this

T. J. MC CAUSTLAND.

session (Cries of "Go on") or distract their attention from other business beyond saying how glad they were to be with them. "You have been," continued the speaker, "to see us twice; please remember that luck goes in odd numbers. Therefore, we are waiting to welcome you once more. We thank you for what you give us on this occasion, and we know from all that we have already received, what we have yet to get and which must give us the greatest joy, and we welcome it as coming not merely from our friends, for the relationship is closer than that, it comes from our brothers." (Loud applause.)

A New Bessemer Medalist.

The chairman announced that the king had graciously signified his willingness to receive a deputation of Americans on the following Friday. He was sure that great compliment would please every American. He believed it was the first time his majesty had ever received a body of technical men, and it was a very great honor. He had also to announce that the council had decided upon a somewhat unusual course. They were going to present his majesty with a Bessemer gold medal. That was a special honor because his revered mother, the late queen, was good enough to accept a similar medal. With regard to the presidency for next year, Sir Hugh Bell had been unanimously requested by the council to accept office, and he expressed his willingness to do so. (Applause.) Sir Hugh Bell's election for that honorable position would add further dignity to it. He was a worthy son of a worthy sire, and they all wished him success. His father was a master of the art of metallurgy and the world had benefited by his researches in iron and steel. Certainly no country had benefited to a greater extent than America from the great labors of Sir Lowthian Bell in connection with blast furnace work. He was one of the original founders who met in that long distant year of 1868, and as a senior member of the council had shown his warmest interest in its work. He had received a letter from Andrew Carnegie who wired—"Sir Hugh Bell will make a model president, one well fitted to take the presidential chair."

They offered their congratulations to the incoming president, and when he accepted office they would indeed be highly favored. (Applause.)

The chairman then presented the diploma of the institute to Mr. J. von Ehrenwerth, (Leoben). He said he made the presentation with very great pleasure in recognition of the good work done in Austria, and they accompanied the gift with their sincere and hearty congratulations.

DR. H. C. H. CARPENTER.

JOHN G. STEWART.

Mr. von Ehrenwerth said he felt most deeply the conferring of so great a distinction from the institute, which he felt was the highest honor he could receive.

The institute then proceeded with the business, reading and discussing three papers on the subject of "Gas Engines" in the following order:

(1) The Design of Blast Furnace Gas Engines in Belgium, by Prof. H. Hubert, (Liege).

(2) The Application of Large Gas Engines in the German Iron and Steel Industries, by K. Reinhardt, (Dortmund).

(3) Notes on Large Gas Engines built in Great Britain and upon Gas Cleaning, by Tom Westgarth, (Middlesbrough).

A. S. THOMAS.

Summaries of the first two were read by Mr. Brough, the secretary, the third paper being read by Mr. Westgarth, himself.

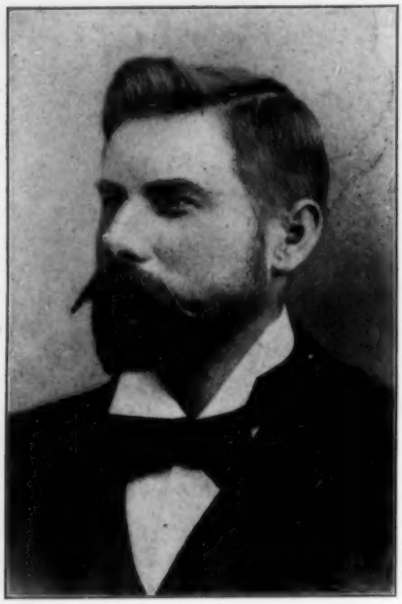
Prof. Hubert added some figures showing that many more horsepower would be available than he had anticipated in his paper. He was hoping that in a few years they would be able to take from furnaces producing 700 to 800 tons of pig iron, 36,000 horsepower.

Mr. Westgarth, also added the remark that the great initial difficulty of cleaning the waste gas for use in gas engines had been effectually overcome.

Mr. Reinhardt in a brief addition said that the great object was to get the air introduced as cool as possible, for the simple reason that the hotter it was, the more vapor it contained and consequently also the more dust. It was better to cool the air before it went into the Theisen apparatus. They could clean gas as effectually when it contained four or five grams as when it contained two or three. But the result of using hot air was that in a few days or weeks the apparatus became so foul that the aggregation of dust made it very difficult to clear.

Julian Kennedy Opens.

Julian Kennedy opened the discussion. They, in America, were mere beginners in gas engine work and could therefore say very little about it, though they all expected great things. They had had a little experience at the Lackawanna Steel Co.'s plant. That company, he believed, was the only one that had done anything at all, and he believed it had had some



HERBERT PILKINGTON.

trouble at the start, which was only to be expected. But it was now achieving great success, and he believed the general opinion was that the era of the gas engine was dawning in America.

Dr. R. W. Raymond, New York, said that after 25 years of service as secretary a fellow began to find out that his knowledge and progress depended upon the whims of the members of his society. When they began to take up gas engines, then he realized that a new era had dawned in civilization. The members of the American Institute of Mining Engineers were just beginning to take them up, and he saw ominous signs of a whole hurricane of papers being received. At present he did not feel capable because he had not read the proofs. But if he had read the proofs he would know all about gas engines and would be a learned authority on the subject. They were beginning to learn that the heat elements must be saved, and they were not so rich that they could afford to go on wasting them by throwing them away. And if they were to maintain the rank to which they had somewhat suddenly jumped in iron and steel, they must bring their bookkeeping in such matters down to the third place in decimals. He thought he ought to say a word for the American metallurgists connected with great corporations. Those great combinations of capital had not only heaped up sums in investments which staggered their imaginations, but they had made the individual dollar go farther by putting the great many individual dollars together. That was the only justification for their large capital. He wished to say in an age when trusts, combinations and corporations got all the blame, they deserved a word in their defense. Such combinations employed the most scientific methods, paid the best wages, did the best work and most effectually served the human race.

Prof. Kent's Remarks.

Prof. Kent (Syracuse) said they had all been greatly pleased in finding out how the Germans and the English had led the way in the adoption of gas engines. The Americans were waiting to see the other fellows do the work and get over the expenditure. It was found in the days of electric transportation in America that the man who was first in substituting electric transportation was the man who lost the most money. (Laughter.) So they waited four or five years until those men had lost their money and they hung on to the mules for five years and made a pile of money. The Americans had saved an immense amount of money during the

FLORIS OSMOND.

last ten years by not building gas engines; now they were going to build gas engines and possibly they would do it a little better. They had let the Europeans spend their money for the American experience. The question was as to the next step. The Germans had developed the question of the cleaning of the gas engines but there was a good deal yet to be done. The blast furnace produced gas irregularly both as to quantity and quality. What they wanted was a kind of governor apparatus that would provide for steady running in the gas engine plant. They had auxiliary producers to make up for the irregular demand. But in the future they would put up a large plant near the large city, and the iron works would supply electric light and power to the city.

It was essential that the gas producer should work directly from bituminous coal, burning the volatile matters right into gas. There were two such producers patented in America, one of which he had patented himself. He ventured to say a great many people were going to produce gas from bituminous coal and the supply would be regulated by a surplus store house of gas connected with the gas producer. They would furnish not only wind for the blast furnace and electric power for the rolling mill, but electric power for the nearest town.

Mr. Duff's Appreciation.

Mr. E. J. Duff, Liverpool, expressed his great appreciation of the papers, especially Mr. Reinhardt's which was the most comprehensive, had gone most thoroughly into the matter and brought them right up-to-date. Eight years ago he had himself erected some coke ovens at Widnes, and he found they had some surplus gas from the ovens. He put in a recovery plant, but he still found when they had used all they required there was still a small balance, and they decided to adopt gas engines and utilize the gas and drive a dynamo for the production of calcium carbide. They calculated that they had gas sufficient to run engines of 500 horsepower, but at that time they could not get such big engines built, so he employed two of 250 horsepower each. Very little scrubbing and washing was necessary for the gas, and the only alteration he found necessary was the insertion of apparatus to hold the oxygen of the air, and to take out the sulphur and cyanide. He found there was enough cyanide produced to make its recovery well worth while. One firm for which he had put down a

R. MASON.

set of Duff producers with a capacity of 100,000 horsepower had saved enough sulphate of ammonia to pay the coal bill. Some hard work had been accomplished by Mr. Beardmore, to whom they were greatly indebted for the successful application of gas to the rolling mills and steel plants. And that had all been accomplished since he designed Mr. Beardmore's first plant four years ago. A very important installation had been erected at Madrid, and further engines had been put in at Nuremberg of 2,000 horsepower, making with the six engines a total capacity of 12,000 horsepower. They had run for six months without a stop and they had no trouble whatever with the tar. All were Duff engines.

German Progress.

Mr. James Hamilton (Coatbridge), said that England must rather envy the great progress and development among the Germans. But any delay in England was the fault not so much of the British gas engine maker as the British gas engineer. The Germans had been more ready to adopt the gas engine. The gas engine in Great Britain was now at its period of initiation, and would be developed much more rapidly in the future. It was a pity that iron masters had not considered its merits to a greater extent because of the great savings which had been effected wherever it had been tried. But it was clear that the British gas engine was not developing on quite the same lines. The Germans had gone in for an increase in power, not so much for increase in economy. The four-cycle was more economical than the two-cycle engine, but that was not altogether the reason for its adoption in Germany and Belgium. In Great Britain a greater amount of work had been done with producer gas than with blast furnace gas. Consequently the English engines had been developed rather with a view to economy. With blast furnace gas the little extra consumption was not of much consequence. In blast furnace engines the saving as compared with the steam engine was 5 to 1. The British gas engine has been developed rather for producer gas because coal was cheaper; but the first cost of installing such plants was greater than for the blast furnace. Continental designs had been adopted to a certain extent in Great Britain, the future must decide which type was the best.

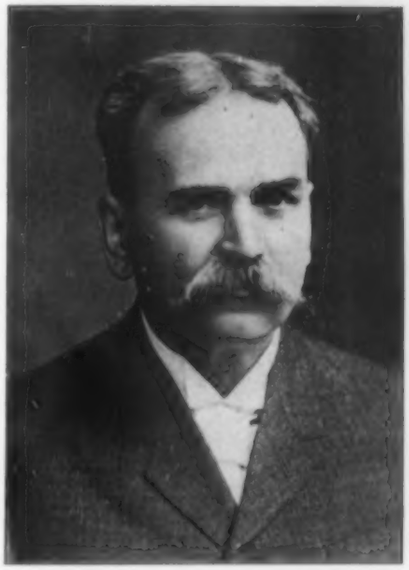
Mr. Tannett-Walker, Leeds, spoke in appreciation of the papers considering Mr. Reinhardt's of very great value; but a good deal was yet required before they

HERMAN HUBERT.

were perfect. With regard to their American friends it was all very well for them to wait for other people to achieve perfection for them, but if there were no pioneers there would be no inventions. (Hear, hear.) He took exception to the statement that all developments had been made by the Germans; it was simply not true. The Germans had largely developed the gas engine but they were not the originators or the pioneers of the gas engine. They must go to the old country to find the authors of the gas engine. Many years ago the Otto gas engine was offered to his own firm at Leeds and he was sorry that they did not accept it. But Crossley Brothers took it up and developed it with marvelous success.

Losses and Gains.

Capt. Mark Robinson (London) agreed that there was a great deal to be had



PH. BONVILLAIN.

and also a great deal to be lost by the gas engine. While the papers were valuable, he should have liked something to be said on the use of the scavenge. The great German makers of the four-cycle engine did not use the scavenge, considering it quite unnecessary, but it would be an excellent thing for the English designers if they could get a pronouncement by the Germans as to whether this very expensive apparatus was really wanted. Apparently, they seemed to think it was not. But it must be remembered that the Germans were working with a much cooler gas, not so liable to various troubles as the producer. It would be a good thing if a paper were brought forward on the subject in future.

Prof. Turner, Birmingham, said he could not speak with authority on the subject, because such engines were not used much in the Birmingham district, but at the Birmingham university they had a plant of 150 horsepower which was used for the production of electric current for various purposes throughout the university. They had had no trouble, and the engines worked with the greatest possible satisfaction. They had been waiting a long time for the information now given and for which they were very grateful.

Mr. Thwaite, expressed the opinion that the energy produced by blast furnace gas would be quite equal to half a million horsepower. The speaker gave extracts from papers by himself in 1894, to show that he had already anticipated the great possibility of gas production but at that time he preferred carbon monoxide and the exclusion of hydrogen gas. They were almost justified in assuming that the

EDWARD C. IBBOTTSON.

SIR HENRY CAMPBELL-BANNERMAN.

maintenance of their iron trade prosperity lay in the direction of the application of blast furnace gas, and the splendid enterprise of the Germans had had its justification and reward in their enormous output. He hoped that the work in every country in connection with the gas engine design would lead to still further triumphs.

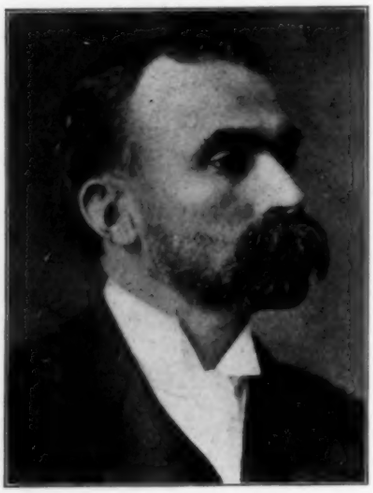
This concluded the discussion and the institute adjourned.

AMERICAN SESSION—WEDNESDAY.

The proceedings on Wednesday were devoted to a general meeting of the American Institute of Mining Engineers, under the presidency of Mr. Robert W. Hunt, Chicago. A special invitation had been given to the members of the Iron and Steel Institute to attend the meeting, and a large number were present. By invitation of the president, several members of the British Institute council occupied places at the center table, Mr. Hunt having on his right Dr. Raymond, the secretary, and on his left Mr. R. A. Hadfield, the president of the Institute.

President Hunt's Address.

The president at once proceeded to deliver his address, which occupied about three quarters of an hour in delivery, and was devoted mainly to a history of the progress in America of the Bessemer process. He remarked that while the actual dates of the organization of the American Institute of Mining Engineers and the introduction into America of the Bessemer process were not exactly identical, they were so close together that their histories ran largely parallel. That fact rendered a history of its American progress very fitting on the occasion of their holding a meeting in England. In no sphere had the danger of prophecy been more clearly defined than in relation to the iron and steel industry. So frequently had it seemed that the summit of all possible achievement had been reached that the most astute mind ventured to assert that conclusion. Again, physical conditions had apparently been so clearly unalterable that deductions as to the possible and impossible seemed safe. In the seventies a distinguished iron metallurgist, a gentleman whom it was the pride of both hemispheres to honor, visited America and carefully studied the iron and steel situation, with the result that he unhesitatingly proclaimed that the development of her possible production of iron and influence in the markets of the world were plainly limited by geographical conditions to such an extent that the old world need not fear her rivalry. The prophecy then seemed absolutely logical and based upon conditions which could not be altered or overcome. Indeed, he gave figures,



DAVID BAKER.

showing that the transportation distances were so great over which it would be necessary to bring iron ore and the fuel to smelt it to a common point and then after its production the transportation of the products to market would again cover such distances that it was impossible for successful commercial competition to be created. At that time, the statement that the total transportation of a ton of ore over about 100 miles of railway including the handling necessary, not only on the cars but to again load and unload to and from ships would be regularly performed at a cost not exceeding $1.40 a ton, and that with about a dollar added to that or, in all, $2.40, the ton of iron ore would be placed at the very center of the American iron industry, would have been received as the wildest lunacy. That had all been accomplished; and instead of having brought disastrous results to the transportation interests, it had, on the contrary, yielded such profits that transportation had been built up to colossal proportions. At the same time, the finished product could be placed at the seaboard for foreign markets at transportation cost, little if any, greater than was required for internal transportation in many European countries. Those low carrying charges had been co-relative with a tremendous ore development in the Lake Superior region which had steadily increased until in 1905 the extraction was 34,353,456 gross tons. While there still remained many proved millions of tons of ore it was recognized that such a production could not be indefinitely maintained, and this condition was leading to increased interest being taken in the other ore sections. Some of these, while well known, had been unworked either because of location or the comparative low iron percentage of the ore.

Progress of the South.

The mineral resources of the southern states impressed Sir Lowthian Bell when he was investigating iron conditions, and he predicted a prosperous future in that region. For some years, it seemed as though such hopes were doomed to disappointment. But there was no longer any doubt of the wisdom of the prediction. The pig iron production in the southern states had grown from 387,000 gross tons in 1880 to 3,100,000 in 1905. During the same period the investments in cotton mills had increased from $21,000,000 to $225,000,000 while the capital invested in the southern states in all kinds of manufacturing increased from $257,000,000 to $1,500,000,000. As might be expected, with this great revolution in cost of transportation, there had also

R. B. HALDLANE.

come a revolution in selling prices. While the political policy of the United States had tended to maintain a higher range of prices than would probably have prevailed under other conditions, it was true that during the time of severe business depression, steel rails were made from ore mined at the head of Lake Superior, smelted with coke from Pennsylvania coal, transported about 500 miles to Chicago, and there sold delivered at $15 per gross ton and at that price, under the then existing conditions, was within the cost of manufacture. It was most earnestly to be hoped that such times might not return but if, under pressure, that could be accomplished some years ago, there was no reason to suppose that under similar stress the history could not be repeated.

The speaker proceeded to trace the history of the progress of Bessemer steel since the production of the first heat in an experimental plant at Wyandotte, Michigan, in the autumn of 1864, with the first commercial rolling of steel rails in the Cambria Iron Co.'s mills at Johnstown, Penn., in August, 1867, from steel made by the Pennsylvania Steel Co. at Steelton. The development of the business was very rapid, but not always attended with profitable results. Summarizing the history of the early mills Mr. Hunt pointed out that one of the first ten works had gone absolutely out of existence, while only five are now making rails. One of these has but a limited production in that department, and the other four are making their rails in mills not then in existence, and in one case in a mill hundreds of miles away. Three of the separate corporations have since been consolidated under a new title into one, which with its new mill is enumerated in the existing five, and this mill is situated some miles from the location of either of the original ones. Two of the other companies while actively at work in other lines, have ceased making rails. Since 1876, in addition to those already mentioned, seventeen corporations have erected mills to roll standard weight steel rails, thirteen from steel of their own manufacture and four from purchased blooms. Seven of the steel producers are now making rails, two are on other products, and the remaining eight have gone out of existence, so that there are now in the United States ten corporations running thirteen rail mills. Of these, one company is rolling its rails from basic open-hearth steel and another one from either that or Bessemer.

T. WESTGARTH.

Three of the companies are controlled by one parent corporation, three others by another, and two others by still another, thus leaving two single and independent concerns. In addition the building of another mill of large capacity to roll basic hearth rails with the required blast furnaces, steel furnaces, and a town is actively under way, this being done by one of the subsidiary companies of the United States Steel Corporation. The contemplated expenditure will amount to some $75,000,000.

Rails in Canada.

In 1876 Canada did not possess a steel rail mill of any kind. Today there are

SIR JAMES KITSON.

two situated some 1,500 miles apart, one practically on the shores of the Atlantic and the other at the foot of Lake Superior. Referring to the western one, the speaker pointed out that the ore has yet to be brought from Lake Superior deposit in the United States and the coal and coke from the States of Ohio, Pennsylvania, and Virginia; that this is at all possible illustrates how low transportation charges have been brought. Both works are operating successfully, and enjoying bounties from the Canadian government, but as yet the production is not equal to the immediate demand of the Dominion. The attendant instances have been startling and the results tremendous. In ten cases absolutely new communities have been organized and these have grown to embrace thousands of people. In nine cases the then existing communities have been at least temporarily injured, but in no instance can such harm be compared to the other good.

HENRY M. HOWE.

The president next plunged into a detailed account of the development of production, remarking that it was a well known matter of history that Mr. Alexander Holley was the first to bring to America the Bessemer process in an organized condition, and after several years of legal skirmishing a consolidation of the patent interests involved was effected, following which the erection of works to make steel by that process was quite rapid, Holley acting as consulting engineer during the construction and the subsequent operation of all but three. While some of these failed, his personality was indelibly stamped upon American Bessemer steel makers. Fortunately his efforts were joined by those of a number of exceptionally capable men. The names of Holley, John Fritz, George Fritz, William R. Jones, Daniel M. Jones and Robert Forsyth furnish a galaxy of talent which makes plain why America so soon forged to the front in Bessemer steel production. Referring to Holley's yearly visits to Europe, Mr. Hunt said that largely by reason of his charming and lovable personality he received free access to practically all steel works, and it was well understood by his hosts that he was seeking information to be used by his American clients, while it was equally well known that he was ready to freely give in return the best he had. The speaker recalled a joking prophecy of his at an institute meeting, "You may think me crazy, but I believe that some of you will live to see the open-hearth process attend the funeral of the American Bessemer." Upon this Mr. Hunt remarked, "The death has not yet occurred, alas he and many of his listeners have passed away, but some still live and know that some members of the American Bessemer family have at least begun to realize that the limitation of production by that process has been reached."

Invention of the Blooming Mill.

Mr. Hunt went on to trace the invention by Mr. George Fritz of the blooming mill as a substitute for the hammer in dealing with steel ingots. The adoption of this method in 1871 greatly helped to increase production. After giving figures showing the increases, the speaker showed how Mr. Andrew Carnegie in 1886 displayed his acute business acumen in this as on many other occasions by directing Capt. William R. Jones, manager of the works, to prepare plans for the very best rail mill he knew how to design. Said Mr. Hunt: "Capt. Jones in one of our many intimate talks told me that some time afterwards Mr. Carnegie asked him how he was progressing with his plans, and on his reporting asked how much the mill would cost. The captain replied that he could not then tell. Mr. Carnegie said, 'Well, we must place some limit on its cost.' Jones answered, 'You told me to design the very best mill in my power, now if I am to be limted by the cost sheet in so doing I must give up the job.' Mr. Carnegie then asked, 'But if we build such a mill, how much will you promise to increase its production over the present one and how much per ton will you save?' Jones answered, 'I will promise to double the output and save 50 cents per ton.' 'All right,' was the answer, 'go ahead and do your best.' The new mill started in 1888 and all promises for it have been much more than fulfilled. Its record production of rails for a month is 61,033 gross tons."

After tracing the further development of the Edgar Thomson steel works, the Lackawanna and the Scranton company, Mr. Hunt observed that it was somewhat remarkable that the reversing rail mills in America should have developed such a migratory disposition. The record tonnage given strikingly illustrated the great increase in American output but all the other American works were running splendidly. This large output Mr. Hunt attributed partly to the abandonment of the casting pit and the adoption of the present practice of filling the molds while standing on cars, pointing out this was suggested at a meeting of the Institute in New York in February, 1885. Another very important element was the use of metal direct from the blast furnace, which not only added to product but decreased cost by saving the expense of remelting, but was not entirely successful until the mixer invented by William R. Jones was adopted. Personally, he had wondered whether if the use of natural gas had not been possible Mr. Jones would have made the venture. Undoubtedly, the invention would have come in time, but probably would have been much delayed.

Mechanical Appliances.

Referring next to mechanical appliances, Mr. Hunt said he did so with some modest hesitation, because of his own share in them. Holley had said in that spirit of prophetic jest so constant and so charming in him that the day would come when we would start a rail mill on Monday morning and then go home after locking the door, only returning each morning to count the rails that had been made during the preceding twenty-four hours, no other manual labor being necessary. (Loud laughter). Mr. Hunt remarked, "that point has not been reached, and in fact the output has become so rapid that if the account were not kept as the rails are made, I fear the enumerator would never catch up. How Holley would revel in the knowledge of what is being accomplished." Mr. Hunt went on to describe his own introduction in March, 1884, of driven tables in front of the finishing rolls of the rail train of the Albany and Rensselaer Iron & Steel Co. and subsequently an automatic arrangement in front of the roughing mills. These and similar improvements reduced the number of men at the rolls from 17 to 5 while the production was increased from 300 to 3,000 tons per day. The table schemes brought out by various inventors were all based on the original one. Some of the inventors had reaped pecuniary reward, others were still in the hottest of the conflict, no doubt hoping for personal success and emoluments, but over and above all other considerations giving their very best towards the success of their works. Said the speaker, "I cannot mention them all and whom could I select?" Mr. Hunt next traced in some detail the modifications in the shape, weight and composition of the rail. He had no doubt that had ferro-manganese been then known, the early rails would have been rolled from dead soft metal. The rails were hardened, and the rail sections were increased, but as the results were not satisfactory, there was a demand for lower carbon steel. Eventually, harder steel won the day, and had since been in universal use on American roads. American railways now require very much harder rails than those of Europe, regardless as to the climatic conditions under which the rails are to be used. In fact, thousands of tons of 80-pound rail with carbon contents to the height of American specification have been and are in safe use on Canadian roads, some of them made in Great Britain, some in the United States and others in Canada.

B. H. THWAITE.

Basic Open-Hearth Steel.

Coming next to the development of basic open-hearth steel, the speaker pointed out that in 1905 there were rolled in the United States 183,264 tons of basic open-hearth rails. That was small as compared with the Bessemer tonnage, but it was the hand writing on the wall. Two attempts to make steel in America by the basic-Bessemer process were technically successful, but owing to the character of the iron obtainable, they failed commercially. The speaker described the McKenna process of renewing worn rails which at one of the company's mills had been continuously successful.

The rails were passed, at a low temperature, twice through a tandem mill. The weight of the rail was about 10 per cent to 12 per cent lighter than the original section. A number of the leading western railway systems were regularly employing the method with satisfactory results.

Mr. Hunt next showed how the rolling of structural shapes and the output of blast furnaces had enormously increased. The latter could not have taken place but for the fire brick stoves "as in many other cases Americans had to come to England for that which made such driving possible. They may have been improved and other names deserve honor for what has been done but that of Whitwell will ever stand as the foundation one."

Dealing with this in some detail, Mr. Hunt considered that undoubtedly the use of the German scheme of a mixing receptacle had done much to permit the driving of the blast furnaces supplying steel plants, and of course, the tremendous output would be impossible if the raw materials and in fact the produced metal were not handled by machinery much of which is of automatic character. Some of these not only moved the stock but regulated the charging and distribution of it in the furnace. Next to the use of gas engines, for which they had to thank the old world, the development in blast furnace practice attracting most attention in America was the

application by their past president, James Galey, of refrigation to the blast, the results from which were very encouraging, and its use was being taken up by other concerns. There were many other developments, which the hosts of the Iron and Steel Institute must come to America to see for themselves. They might not want to copy, but they could at least see what to avoid.

New Honorary Members.

The president concluded: "the Iron and Steel Institute is fortunate in having been made a custodian of funds from which it can bestow emblems of honor upon gentlemen who have distinguished themselves in the field covered by the purchasers of the institute's organization. In making such award its council have seen fit to recognize several members of the American Institute of Mining Engineers by awarding to them the Bessemer medal. I can assure our hosts that in this recognition of the merits of its members, our whole institute has been honored.

"As an individual association the American Institute of Mining Engineers has not a medal of its own to bestow, but it has the power to give that which seems to it to possess claim to desirability though it has not been lavish of this distinction. Under our rules it can be possessed by twenty persons at the same time, but there have seldom or never been more than ten, and our latest printed role shows only eight. And what is still more remarkable, there is no English name upon it while in the past it bore the names of Bell, Percy, Roberts-Austen and Siemens. The council of the American Institute of Mining Engineers felt that the occasion of this meeting in England as the guests of the Iron and Steel Institute was a fitting time to bestow upon two distinguished Englishmen members of the latter society our institute's greatest recognition of merit. (Loud applause.) In making the award it was felt that if looked upon in a competitive sense, the task of selection was a hopeless one. All could not be honored, but it was also felt that in designating two gentlemen on whom the Iron and Steel Institute in 1901 and 1904 bestowed the Bessemer medal, men who have given such service in the investigation and development of the art of steel making our society would be honored equally with the recipients. Therefore it is my very pleasant duty to announce on behalf of the American Institute of Mining Engineers the election to honorary membership in that society of John Edward Stead, F. R. S. and President Robert Abbott Hadfield, and to present to each of those gentlemen a properly engrossed certificate of such membership." (Loud and prolonged applause.)

Thanks for Honors.

Mr. Hadfield, who was received with applause, said he took the compliment not only as one to himself, but to the metallurgical industry of England. He had received very much from their country, and would greatly prize that honor. He had been a member of their society for fifteen years, and that association afforded him the greatest pleasure. He should never forget the welcomes he had received in America. He wished also to say with what satisfaction they had listened to that most eloquent address from the president, who had given an enormous amount of practical detail showing why America at the present day is at the head of the iron and steel industry. Englishmen heartily congratulated them, and they believed in future years this country would benefit quite as much as America.

Mr. J. E. Stead said that he also had been a member of the American society for a great many years. He sought the honor of ordinary membership, because the American society had so many prominent and learned metallurgists associated with it. He had found their papers most valuable. At the same time, he considered the honorary membership a very great honor, and it was a very proud day when he received from Dr. Raymond a letter intimating his election. It was a compliment not only to himself, but to the Iron and Steel Institute, and a new link which would tend to bind together the two great English speaking nations of America and England. He thanked them sincerely for the honor.

Dr. Raymond at this point intervened to urge upon the members the valuable opportunity afforded them by the supplementary excursion to Germany which had been arranged. So far, about 30 had expressed their intention of joining the excursion. The doctor added an earnest appeal to members to express their views in papers rather than by extemporaneous statements. That was really the only way in which a member could say exactly what he wished.

Discussion of Papers.

The meeting then proceeded to the reading and discussion of papers. The first read being: "A Comparison of American and Foreign Rail Specification," by Mr. Albert Ladd Colby.

Mr. Colby, after giving some extracts from his paper, said the time was peculiarly opportune for the comparison of standards.

Mr. Winsor Richards said the real question was as to the proper proportion of phosphorus. The matter had been considered in Great Britain by a committee representing the societies of the Mechanical Engineers, Civil Engineers, the Iron and Steel Institute and the Naval Engineers. They had given the matter their most careful attention and had had many interviews and discussions. They had arrived at last at an analysis which provided that carbon was to be in the proportion of 0.035 to 0.5 per cent, manganese from 0.07 to one per cent, silicon not to exceed one-tenth, phosphorus 0.07 per cent and sulphur 0.07 per cent. The question of phosphorus was the most important point of the analysis. For many years until very lately they always agreed to supply steel that should not contain more than 0.06 of phosphorus. The iron ores were not quite so good now as they formerly were, and the manufacturers at that meeting tried to obtain an increase of

R. A. HADFIELD.

JOHN EDWARD STEAD.

ELECTED TO HONORARY MEMBERSHIP IN THE A. I. M. E.

allowance in the matter of phosphorus. They asked the sub-committee first of all to agree to 0.08 per cent of phosphorus. That was discussed at many meetings and carefully considered and the recommendation was made to the main committee, but that recommendation was not agreed to by the manufacturers. They asked for 0.08 per cent and tried all they possibly could to obtain it, but they failed. The English engineers in Great George street, and in fact all over the country representing those important associations would only agree to 0.07 per cent as an absolute maximum.

Mr. Colby was an able advocate, but with all his ability he would not have been able to persuade the English engineers to agree to the larger quantity. Mr. Colby very ably advocated that the American should agree to 0.1 or 0.11 per cent of phosphorus. But the English engineers considered that quantity much too large and would not agree to it upon any terms whatever. Consequently he thought that in Great Britain the manufacturers would have to be content with that. He understood from Mr. Colby that it was impossible for American rolling mills to produce rails under 0.1 per cent of phosphorus. That would not be received in Great Britain. The other chemical composition with the exception of phosphorus represented the standard to which the English committee would agree. Personally he thought the discussion should be mainly concentrated upon phosphorus.

Mr. Price Williams said he should like to see a copy of those specifications furnished to some of the chief engineers of the railways. The manufacturers had made their chemical pronouncements beautifully illustrated with photographs, but they were still lacking information on the life of the material. On that point he had seen no particulars. One of the distinguished American engineers, Chenoux, who was the discoverer of the phosphor-unit, laid great stress upon the question of durability. He entirely agreed with the suggestion that the proportion of phosphorus should be 0.07 per cent and he could not help feeling that the tests made, such as the falling test, were extravagant and disproportionate in the matter of impact to what rails were exposed to in ordinary wear. The Great Northern railway got out its information very carefully, and he could not help wishing that the railways were a little more generous in supplying details.

Makes a Suggestion.

He threw out the suggestion as to whether they were not already on the extreme ground in adopting too small a percentage of phosphorus in view of the great value of manganese in connection with rail service. Had not the time arrived when engineers on both sides of the water should confer on the point as to what composition would show the longest survival life as compared with the money life of the rail. He had no doubt that such a conference would lead to increased durability of the permanent way.

Mr. F. W. Harbord (Englefield) considered that 0.08 per cent was more reasonable than 0.07 per cent. There would be no difficulty in making a rail with a proportion of 0.06 to 0.08 per cent outside the Bessemer limit and the 0.1 per cent of phosphorus suggested referred to Bessemer rails only. It was a great pity that the question of carbon had not been dealt with in the specifications. The question of hardness depended to some extent upon the manufacture. For a basic-Bessemer rail they could take a higher carbon steel within the region of safety, and he had heard lately of rails going up to 0.6 and 0.7 per cent of carbon with excellent results. The question must be tackled and they must not fix the proportion of carbon without taking into consideration the method of manufacture.

Mr. R. A. Hadfield agreed with Mr. Richards that the author of the paper, face to face with English engineers, would have had great difficulty in convincing them that the addition of phosphorus would still leave them with a safe material. In America it was found that with higher carbon, within certain limits they had greater durability in the rail, but unfortunately higher carbon and phosphorus involved more risk in the use of that material. Many of them visited on the previous day the physical laboratory and they saw the test machine at work. He thought it would be a very good thing if they could send some specimens containing a comparatively large amount of phosphorus and let Dr. Glazebrook carry out a series of experiments. Probably, it would be found that steel containing 0.1 per cent was not a safe material to use. The point had been under consideration in conjunction with other important matters for many years. The speaker asked permission to supplement, by way of digression, a speech of the previous day by mentioning that a well-known body of technical men, the Mechanical Engineers, were extending their hospitality to the American visitors. President Martin, who was with them, would be delighted to welcome the members of the American Institute on the Cardiff trip.

The chairman remarked that no apology was necessary for omission. President Hadfield's hands on the previous day were so full of gifts that they overflowed. (Applause.)

Danger From Broken Rails.

Dr. Raymond read the following letter from Mr. E. F. Kenney, the engineer of tests in connection with the Pennsylvania Railroad Co.:

"The author has certainly been misinformed regarding the real situation of American railroads. Very convincing testimony has been furnished on both the American Society of Civil Engineers and American Railway Engineers and Maintenance of Way Association showing that nearly every American railroad having heavy traffic is suffering greatly from broken rails. The rails are not giving satisfaction as to wear, and any attempt to improve the wear by making rails harder is met by a crop of brittle rails. This brittleness is caused by high phosphorus content. Rails with lower phosphorus have been made in which carbon was quite high and thereby got much better wearing qualities without being brittle. But as long as the phosphorus is kept up around 0.1 per cent it will be impossible to get rails that will wear well without being dangerous. Far from being as the author states, the brittle rail is one of the most important subjects before the American railroads today. Phosphorus is an unmixed evil and any reduction in phosphorus contents will mean much to the users of the rail, both as to wear and safety. If the softness asked for in the foreign rails is required for safety, the raising of the phosphorus content will necessitate lower carbon to get equal insurance from brittleness. Arguments in favor of raising the allowable phosphorus content are not sound. Careful heating and lower finishing temperature might overcome the difference of 0.02 per cent in phosphorus if the lower phosphorus rail was heated too high and finished too hot. There is no reason why a material containing low phosphorus should not be equally well heated and finished as one with a high phosphorus. Moreover there is small likelihood of getting rails well heated and finished under the proposed specification. There is no limitation whatever with a finishing temperature so that cool finish is not likely to be obtained. Recent American specifications all fix the maximum shrinkage allowance and regulate this, but it is being steadily opposed by the manufacturers. The proposed specifications

make no mention of hot straightening. This is most unfortunate as many broken rails reported by American roads can be traced directly to injuries received in straightening. The hot straightening is very often carelessly done, and the rails come down to the straightener in very bad shape. This necessitates a very great deal of severe gagging under the straightening presses. The evil has attained such proportion that the writer proposes that the maximum camber be specified for rails arriving at the straightening presses and a requirement be made that all rails arriving at the straightening presses having a greater camber or having sharp kinks be marked as No. 2 quality before being straightened and only accepted as such. This requirement has been accepted by the American Society of Civil Engineers' committee on rails and incorporated in its specification. It has also been adopted by the American Railway Engineers' and Maintenance of Way Association and put in its specification. A little more attention paid to hot straightening will reduce greatly the number of rails ruined in the gag presses. The word "sufficient" in clause E relating to the cropping should be qualified to make it more definite. It has been used in most American specifications until recently, and has been uniformly interpreted by the makers to mean "sufficient from their point of view." The inspector at the mill has no voice in the matter. All that is now done in shearing is to cut away the material until no black spots are shown after the bloom is cut through. There is no attempt to remove segregation and unsoundness. This is not sufficient to insure sound material and the makers know it, and yet they oppose the specification of a definite discard. A certain percentage of the whole ingot should be specified as the minimum discard from the job."

Another Cause of Trouble.

Dr. Raymond also read a letter from Mr. W. E. Freer of the *Light Railway and Tramway Journal* calling attention to the corrugation of tramway rails which he said was causing great anxiety on the continent and in America. In the form of its wave-like appearance it was causing trouble also in France and India. It was a nuisance to the tramway engineer and a source of monetary loss. The cause of those corrugations was shrouded in mystery. The writer suggested that it might be caused by improper rolling. He quotes the following analysis as one generally accepted: Carbon, 0.35 to 0.5; manganese, 0.7 to 1; silicon, not more than 0.10 (generally 0.07 or 0.08); phosphorus not over 0.07, and sulphur, 0.07. This should give a fairly sound rail. He suggests that it is possible that a harder rail would reduce the liability to such wave like depressions and asks, "Is there anything in the idea that the rigidity of the tramway track is conducive to the mischief? The *Tramway World* would be grateful for information furnishing answers to these questions."

Mr. J. E. Stead said that chemists in this country were all agreed that if they raised the carbon the phosphorus became more pronounced. The reasons were very well known. He thought it would be a mistake to make the proportion of phosphorus so high as 0.1 per cent. With regard to broken rails he had found that high manganese caused more broken rails than high phosphorus. High manganese combined with high carbon produced a very treacherous metal. It did not necessarily make it brittle, but it was more susceptible to changes of temperature during its production.

Mr. James E. York considered that the physical treatment of the rail had a great deal to do with its durability. Rolling at a low temperature had a great deal to do with fracture and if they once developed cracks the material would never become solid again. The same result would be produced by the lack of harmony in parts of the machinery caused by one part delivering faster than the other which laid stress on the rail and would cause it to yield to a sudden blow in the track. The rails in England did not break anything like they did in the United States. If the rail was rolled at too low a heat, it was exposed to a kind of stretch causing a certain amount of internal violence. He had seen rails which carried three times as much phosphorus as was now considered necessary and yet did not break in the track.

The chairman said that the process in America would be so far changed owing to their ore conditions that he believed in a very few years the question of limitation of phosphorus was going to lose its significance.

Mr. Colby said he would prefer to express his reply in the form of a paper. As to the question of fixing a certain discard, that was entirely a commercial proposition.

Mr. Lamerton said it was quite obvious that rails made on the American standard would not do on the English railways because of the difference in the method of laying the rails. The English rails were supported between two points at some distance from each other by a kind of suspension and so were subjected to a number of repeated shocks, but in America they were laid on flat bottoms which acted as a kind of cushion, receiving the blow, and in time the rails themselves became embedded in the roadway.

The remaining paper was by Mr. R. H. Lee on "The Gas Producer as an Auxiliary in Iron Blast Furnace Practice." This paper appeared in THE IRON TRADE REVIEW on Aug. 2, 1906.

Mr. Harbord expressed the opinion that the utilizing of waste gases had almost passed the experimental stage. He was himself putting in a producer plant.

At this stage the conference adjourned.

THURSDAY'S SESSION.

The Revival of Puddling.

The proceedings of the meeting were concluded with a joint meeting on Thursday over which the British president, R. A. Hadfield, presided at the invitation of the American president, Captain Hunt.

The first paper read was on "The Development of the Roe Puddling Process," read by Mr. James P. Roe of Pottstown, U. S. A. An abstract of this paper will be given in THE IRON TRADE REVIEW next week.

A discussion followed. Dr. Raymond said that that invention was believed by the Americans to mark a rather remarkable reversion in progress, inasmuch as it was a step in the revival of the puddling furnace. This was a rather startling and striking fact, because years ago they held the funeral, had the obituaries printed and the requiem pronounced on the old puddling furnace. They were now having more furnaces of the old fashioned type put in operation, and new ones being built every year. The secretary of the department of agriculture had been making complaints about the quality of the steel used for wire fences. They compared very badly when set alongside the old fashioned fences, which were found uninjured after 30 years' wear. The new steel wire fences were done for in a couple of years. The same complaint was made about cables. Many of them years ago were aware of that difficulty and among iron masters it was attributed to the presence of and the irregular segregation of the manganese in all the steel used for this purpose. It is recognized among American people that the old iron wire and sheets stand a great deal better than new steel in all places where corrosion is to be feared. One of their vice presidents now present told them at the Baltimore meeting last year that he had restarted an old mill which had

long been idle and left in charge of the watchman.

Some of the materials had been carried off by the boys. But he found some of the old parts of the roof laid on fifty years ago as good as ever. Their steel makers must face that question, because as long as they had to use manganese in steel—and they would have to use it—there was the danger of corrosion. Once more they were facing the questions which they had dropped when they thought the old puddling furnace was dead. Of course, all questions of improved furnaces had long been dropped. But he had just heard that when some iron masters lately visited Italy they found two of the forgotten old Danks furnaces still running splendidly. This question would have to come up, because if iron was to be puddled they must have mechanical puddlers. The Americans believed that Mr. Roe had hit upon the right idea, because he had eliminated the high cost of labor without injury to the quality and without increasing the weight of the charge. That was the great problem in the position now confronting them; they had to make things wholesale, and still to make them as good as they used to be made when worked on a smaller scale.

Mr. G. Ainsworth (Consett) said he should like to compliment Mr. Roe on the great ingenuity he had shown in carrying his conception up to the present stage, and on the great determination he had shown in grappling with this difficulty, which many of them thought would be insuperable. Whatever the commercial aspect of the process, the mechanical achievement was very interesting.

Witnessed the Operation.

Mr. A. Sahlin (Brussels) said he had seen the process in operation. When he first heard that Mr. Roe was working on the problem of mechanical puddling, his first feeling was one of regret. Having worked side by side with him, he had learned to respect his genius, but he was a little surprised to find him reverting to an old process which seemed to be out of date. Like others he had held to the conviction that steel was becoming a substitute for iron, and he at first thought also it would be difficult to make any new modification of the puddling process yield a profit. When, some time ago, he went into the Roe works, he thought he was merely coming to assist at the post mortem, but he left the establishment convinced that he had witnessed a resurrection. He had seen charges of 3,600 pounds of molten iron turned into one solid ingot weighing more than the iron originally charged in the furnace; and only 88 minutes had elapsed from the time it was charged until the puddled ball rolled automatically into the squeezer. And that was done with a heat which would have scorched the puddler's skin. One most remarkable fact was again brought home, that every great metallurgical invention bearing on the manufacture of iron and steel originated in the brain of an Englishman. (Laughter.) He was glad to be there when that particular Englishman returned to the place of his birth, from the new country to which he now belonged, to describe his invention. The machine was a good one and very ingenious in its detail, and there was none of that penurious economy that they were accustomed to find in experimental machines. At the same time, there was very little power required, though some little hydraulic force was necessary. There were very few men who had to work harder than the men around the well-equipped Siemens furnace. They were now seeking new results by new means. The reasons given for the practical disappearance of the puddling furnace were no doubt correct. From the point of view of the blast furnace men he would emphasize the low grade of the material put into the puddling furnace. The users of steel demanded a very high standard of material; but blast furnace men could not always work up to the required standard. There would always be a percentage of rough iron and this could be offered to the wrought iron manufacturer. The latter's competition with steel was very severe, his labor cost high, and his furnace losses especially in reheating were very great. Consequently he had to economize. The homogeneous material produced by Mr. Roe's process would open up large and new fields for the trade in the future.

Mr. E. S. Cook remarked that his knowledge of Mr. Roe's process dated from the beginning; in fact, he thought it just possible he had been helpful in some degree in inducing Mr. Roe to persevere in his efforts. The puddling mill had been left to the control of the boss puddler, because the workman was considered to be so troublesome that the general manager had as little to do with him as possible. He had been very pleased to see the progress made. The first efforts were not satisfactory from the standpoint of the regularity and uniformity of the metal. But Mr. Roe persevered and overcame that difficulty. His firm had furnished him with iron of varying composition, some of which contained 3 per cent of silicon and 0.02 and 0.01 per cent of sulphur, but he puddled it with just the same facility as other metals. It seemed to him, speaking from the blast furnace point of view, that they would now add a new outlet for iron not suited to the basic or Bessemer process. He did not see how any furnace could be run exclusively on basic iron. There was an increased demand for iron that would stand corrosion and it was very desirable that they should produce iron of such a price and quality as would compete with steel. If that were done there would be a large market for such a metal. He had a roof at his place which was made in 1880 when there was no such thing as steel roofing and that roof was still in an excellent state of preservation. On the other hand, some material put in four years ago was full of holes and would have to be removed.

Mr. Hartshorne (Pottstown) said that, having been a witness of the work Mr. Roe had been doing from the start to the present stage, he was able to thoroughly endorse what he had said, and the process as it now stood was a thorough, practical and technical success. There was no doubt that with a properly designed large plant it could be made a commercial success.

An Old Puddler's Queries.

Mr. J. Kerr (Motherwell) remarked that as an old puddler himself he was glad to see such a machine brought into existence. But he would like to know whether a high silicon iron was treated in the same fashion as a low silicon. In the ordinary furnace it required very much severer treatment, and the quality was apt to deteriorate, as they all knew. He would also like very much to know how it stood in the matter of fuel. It seemed to him the cost in that respect was bound to be very much less. There was great credit due to Mr. Roe for bringing it forward in such a complete way. It seemed to renew the old Danks puddling furnace; but he would like to know whether it was possible to manipulate the large lumps into smaller pieces, and also what was the cost of the process?

Mr. F. W. Paul (Harrowgate) pointed out that with regard to the elimination of silicon the author rightly attributed the ease of that elimination to the low temperature. It seemed to him that a very strong feature of Mr. Roe's development was that he was able to control that part of the operation very successfully. At the same

time, he was rather surprised that the development was not to be carried still farther by the application to the furnace of the regenerative principle. In view of the economies derived from the regenerative furnace, as compared with the ordinary coal fire, he would like to know whether that was to be done. Mr. Roe attached considerable importance to being able to regulate the temperature throughout, and still greater advantage would be derived from the gas furnace. Numerous discussions with the experienced iron makers as to the Danks furnace had satisfied him that had the Danks furnace been worked entirely with gas, that process would be alive and working today. With regard to corrosion, emphasis had been laid on the influence of manganese, but it was not very clear whether it was due to the manganese "per se" or whether it was due to its presence in greater bulk. Some experiments he made some years ago relative to oxidation satisfied him that it was much more a question of galvanic action than anything else. In all those metalloids their multiplicity induced greater galvanic action, which led to greater rusting. Reference had also been made to the importance of the boiling stage as compared with the ordinary means of relying upon the mechanical agitation by the puddler. That struck him as a very important part of the process, and one which he thought should appeal very strongly to steel makers familiar with the mechanical agitation which takes place in large masses of molten metal of 250 or 100 tons of steel. That being carried out by means of the puddling furnace, it certainly meant that boiling was a cheaper means than mechanical agitation, and the reason given by Mr. Roe appeared to him to be a perfectly sound one.

Mr. E. P. Martin (Abergavenny) remarked that, having been associated with Mr. Melanous years ago in connection with his rotary puddling furnace, they found that the great difficulty was the question of the furnace bottom, but Mr. Roe by his ingenious arrangement of the new bottom had practically solved the most difficult question attached to mechanical puddling.

Taken Into Confidence.

Prof. Bauerman (London) described the paper as an extremely interesting one, of a class very rarely seen, because the inventor had taken them very completely into his confidence, and told them all that was going on. At the same time they would like to have heard more with regard to its development. Although Danks furnaces were spoken of in the past tense, they were not entirely dead. In fact he saw less than three months ago, two furnaces working very satisfactorily in Italy. They were not the original Danks furnace, but were known as the Bouvoir, a development which did away with many of the difficulties found in the original Danks furnace. That original was very defective in its construction, and a bad fault was that it gave too large a ball for manipulation. In the Italian furnace that difficulty was eliminated by melting in a furnace partly jacketed and by a bridge which divided the ball into manageable masses. That made the furnace such a success that it was still in use. The visitors saw the furnace making blooms which were afterwards used for open hearth armor-plating and for other purposes. It not merely gave them the original Danks bloom, but one of double the weight. Personally he was rather doubtful about the want of uniformity. They wanted a manageable mass and they wanted more variety of quality to suit various purposes. For instance, in cable iron they wanted one quality of iron, and for Lowmoor iron they wanted quite another quality. He thought possibly a smaller mass more readily heated might give better results, though he merely put that forward as his own idea.

Prof. Turner (Birmingham) thought that the continued existence of puddled iron would largely depend upon the continuance of the good quality of the material, and in securing that quality the question of fibre or texture was of the utmost importance. He was not clear whether in dealing with the large quantity suggested by the author they would be able to obtain that fibre. Personally, he had taken the view that when they had to deal with large masses of material, it was far better to melt and cast them into ingots than attempt to deal with them mechanically. From the puddling point of view, the author's suggestion obviated a number of difficulties formerly met with, and seemed likely to give them a more economical apparatus than before. He was pleased to see the attention the author had devoted to the composition and quality of the cinder. He quite agreed with the remarks made on the subject, toward the end of the paper. He had himself drawn the attention of the institute, years ago, to the importance of having the right proportion of silica and oxide of iron to get satisfactory results. From the practical point of view, it had yet to be proved that those large masses of iron could be worked in such a way as to get the same regularity of composition and the same reliability of structure as they had when dealing with smaller masses.

Mr. Talbot said he had seen the apparatus at Pottstown some time ago, and he must congratulate Mr. Roe on the progress made since that time. He thought his greatest difficulty would be in getting suitable iron. In America they made much better iron than in England, and he quite agreed with Prof. Turner that the great thing was to get regularity. It was clear that if he was to get absolute regularity by mechanical means, it must necessarily mean a standard of iron to start with. Probably a mixer in front of the furnace which would standardize the iron would overcome the difficulty.

The chairman announced that this would conclude the discussion. They were all much indebted to Mr. Roe and they all joined in according him a very hearty vote of thanks. The author had intimated that he would reply to the discussion by post.

The Rolling of Iron and Steel.

Mr. James E. York then read a paper on the "Rolling of Iron and Steel." This paper appeared in THE IRON TRADE REVIEW of June 21, 1906. In a little humorous preliminary, he said that some people might think it a good thing to kill an inventor (laughter), but he had many years ago set himself to find a substitute for the ordinary railway sleeper, which consumed so much wood and was in other ways unsatisfactory. In developing his ideas he had prepared no fewer than 2,400 drawings. He had brought his little model mills from America and had erected them on the Thames at Millwall, so that they could see the practical side as well as the theoretical. He did not believe in asking a man to accept a description of anything he was able to show him.

Captain Hunt said the great essential was that the articles should be produced in a mill which would make various sections without changing the rolls. When he saw the invention he was convinced that Mr. York had got hold of the right principle, and he was personally gratified, after receiving considerable ridicule for taking that position, to find that John Fritz came to the same conclusion. Another serious difficulty Mr. York met was in persuading the architects and structural engineers to accept the proposed sections. That was always a great difficulty in America.

Mr. K. Kerlen (Duesseldorf) pointed out that the universal girder was not quite a new idea, having been brought before the Institute in 1899. It was

then said that the universal mills were coming—now they were here (laughter). The speaker produced a number of blackboard sketches with a view of showing that unless properly rolled the metal was weakened by irregular stretching, and in one case the breaking of a girder thus improperly treated led to a fatal accident.

Captain Hunt quoted a similar case in which a workman was astride a girder as high as the fifteenth story of a Chicago building. The girder broke, and the man sustained very serious fractures and internal injuries.

A Bit of Fun.

Mr. York made a lengthy reply to the discussion, mainly devoted to a humorous account of his experiences as an inventor, which greatly amused the meeting. He said: "I and my brother were raised at Staffordshire, and I have worked this game, night and day, from Monday until Thursday noon without taking off my shoes." As long ago as 1874 they had built a model for a mill, but never had the money to put it up. At one time he was left entirely stranded because the Americans had so completely standardized labor that they did not employ men over forty. He educated his own men. Speaking of the capitalistic opposition, he said: "They never could bust us or syndicate us or anything else; I never had a strike and I am known as the man in America that the men have never struck against. There are three things I always let alone—a man's nationality, his religion and his politics. I never interfere with them and I never allow anybody else to do it if I can help it." (Loud laughter.) The speaker caused more amusement by showing at the end of his watch chain a miniature beam rolled to the weight of two ounces to the foot. The remainder of the speech was devoted to a racy account of his experience in fighting the German inventor who, he said, had taken advantage of his patent by introducing various trivial modifications. He commented: "If I cannot eliminate every patent he has got and roll with the mill exactly as it was in 1890, I will eat it." (Loud laughter.)

The chairman remarked that metallurgists were credited with being a very serious people, and some ladies had commented that the Iron and Steel dinner must be very indigestible (laughter). Anyhow, they were delighted to have heard those very humorous remarks and they wished Mr. York every sucess with his mill. He was very sorry that the remainder of the papers would have to be taken as read. That applied especially to Mr. Bonvillain's paper, and also to Dr. Carpenter's paper, the doctor being a last year's medalist. But it was understood the discussion would be continued by correspondence. They had had something like thirty-six papers dealt with, and they could not conclude without saying that the congress had been one of the most successful ever held, both as regarded the number and quality of the papers.

Dr. Raymond said he had received a number of papers, making up the total including those brought before the congress to 36. He was going to ask them to take them as read. Some of them related to other metallurgy, such as gold and silver; but it was necessary they should be brought before them, so that they might afterwards be printed.

Hearty Thanks.

The chairman next proceeded to move various votes of thanks to those who had promoted the success of the congress, including the Council of the Institution of Civil Engineers, for the use of the hall, and the various corporations and owners of works and other establishments who had extended invitations to them. That courtesy would be duly recognized by the sending of proper letters bearing the seal of the Institute. Speaking as a member of the Civil Engineers' Council, he was able to say how heartily and unanimously that hall had been placed at their disposal. They were greatly indebted to Capt. Hunt and Dr. Raymond for their help in making the congress one of the most successful ever held.

Capt. Hunt in seconding the resolution said he desired on behalf of the members of the American Institute of Mining Engineers to thank the president for his kind expressions, and their friends for the most delightful time they had given them. He seconded the resolution with great pleasure; and in accordance with the custom of their institute their thanks would be formally conveyed by letter to the association and persons who had been so good to them.

Dr. Raymond said that in joining in that expression of gratitude the Americans were looking to the future as well as to the past. It was prophetic as well as reminiscent, and it was that kind of gratitude which was defined as a lively expectation of favors to come. The resolution was carried.

The chairman referred to the enormous amount of work done by the secretary in correspondence and interviews, without whose admirable work it would have been impossible to make the congress a success. They would like to hear a few words from Mr. Brough. (Loud applause.)

Mr. Brough briefly acknowledged the compliment, remarking that he felt very grateful for those very kind expressions, and the way in which they were received. This concluded the proceedings.

RECORD ORE PRODUCTION.

According to the annual report of the United States Geological Survey, prepared by John Birkinbine, Philadelphia, the United States produced 42,526,133 gross tons of iron ore in the year 1905, an advance of 6,871,998 tons, or 20 per cent over the previous maximum output, 35,554,135 tons in 1902. The production in 1904 was only 27,644,330 tons, the increase of 1905 being 54 per cent. The largest production of other countries, as recorded to date, were the German empire, including Luxemburg (1904), metric tons 22,047,393, and the United Kingdom (1882), gross tons 18,031,957. The following is a summary of the iron ore statistics for the United States:

	Gross tons.
Domestic iron ore produced.	
Red hematite	37,540,198
Brown hematite	2,546,662
Magnetite	2,417,274
Carbonates	21,999
Total	42,526,133
Domestic iron ore exported	208,017
Foreign iron ore imported	845,651
Zinc residuum produced	90,289
Concentrated iron ore produced	755,677
Stocks of iron ore at mines, Dec. 31, 1905	3,812,281
Stocks of iron ore at lower lake ports, Dec. 31, 1905	6,758,511
Production of mines in the Lake Superior region	33,325,018
Shipments from Lake Superior (1905)	34,353,456

Parrock Re-Elected.—At the annual meeting of the Youngstown Foundry & Machine Co., Youngstown, O., two weeks ago, Thomas Parrock, general manager, was re-elected chairman of the board of directors. Other directors are as follows: W. J. Wallis, A. E. Adams, E. Hartzell, S. K. Hine, Fanny Montgomery and J. J. Kennedy. Mr. Parrock was at one time district manager of the Brown-Bonnell plant of the Republic Iron & Steel Co., and prior to that general manager of the Union works of the Carnegie Steel Co.

The officers of the Indiana Steel Co., Gary, Ind., are as follows: E. J. Buffington, president; G. D. Thorp, vice president; T. J. Hyman, secretary and treasurer, and L. W. McNamee, auditor.

NEWS FROM MANY INDUSTRIES.

New Buyers:—

The Peerless Heater & Valve Co., Detroit, filed amended articles of incorporation with the secretary of state, increasing its capitalization from $50,000 to $75,000.

The Clark Automatic Nut Lock Co., Ltd., Montreal, Can., has been organized with a capitalization of $50,000 by Joseph D. Good, Edward James, Wm. J. Henderson, James Rockwell and E. Languerdoc.

The Lloyd Metal Co., Houston, Tex., was organized with a capitalization of $10,000. The purpose is to manufacture and sell castings of iron and steel. The incorporators are: W. H. Lloyd, W. H. Norris and Joe H. Eagle.

The Detroit Metal Spinning Co., Detroit, Mich., has been incorporated to make brass and sheet metal products with a capitalization of $17,000. The equal part shareholders are: John J. Delaney, James Delaney, Edwin A. Burt and Anthony Bodde.

The Star Foundry Co., Covington, Ky., filed articles of reorganization in the county clerk's office, July 28. The incorporators are: George Klaene, Anton Graving, Gerhard Haas and August Oberding. The capital stock of the company is $20,000.

The A. F. & G. L. Brown Machine Co., Baltimore, Md., was incorporated July 24 by Frank S. Brown, George L. Brown, Fred R. Brown, Charles T. Wherritt and Charles E. Welsh for the manufacture and repairing of all kinds of machinery. The authorized capital stock is $50,000.

The Harry E. Campbell Co., Albany, N. Y., has been incorporated with a capital stock of $25,000 to deal in the manufacture and erection of architectural and structural iron, steel, etc. The directors are: Harry E. Campbell, William H. Stuart, Ogley Roberts, Julius D. Ireland and George H. Grant, of Albany, and Anson Illch, of New York.

The Houston Engineering & Machine Co., Houston, Tex., reported incorporated last week with $45,000 capital stock, will engage in general manufacturing and repairing business. A building 60 x 158 feet will be erected. J. J. Settegast Jr., is president, George Guild, vice president and general manager, and A. J. Binz, secretary and treasurer.

The Teetzel Well Works has filed articles of incorporation with the county recorder representing a capitalization of $10,000. The directors and incorporators are: Frank M. Hoffman, John W. Teetzel and Jacob J. Hoffman Jr. The company will have its principal place of business in South Bend, and will make machinery for the sinking of wheels and shafts and will also manufacture novelties made of iron, steel, etc., in addition to dealing in engines and motors of every description.

The McCune Iron Co., Birmingham, Ala., has been incorporated with a capitalization of $75,000. J. H. McCune is president and general manager. The new concern has acquired the plant of the Birmingham Engineering & Construction Co., which was recently thrown into bankruptcy at North Birmingham. It is intended to make improvements at the plant and resume operation at the earliest possible moment. The works do a general foundry business, manufacturing large castings, stoves for furnaces and other similar work.

New Construction:—

The Cahill Iron Works is making extensive improvements to its plant at Chattanooga, Tenn.

The Charles Abresch Co., Milwaukee, Wis., will erect a four-story building to be devoted to the manufacture of automobiles.

The United States Cast Iron Pipe & Foundry Co. is building an addition to its plant at Chattanooga, Tenn. The cost will be $100,000.

The Leland & Faulconer plant of the Cadillac Motor Car Co., Detroit, is about to equip a brass foundry. Four furnaces are to be installed.

Contract will shortly be let for the construction of an iron bridge 300 feet long across Fourth street, Paducah, Ky., replacing present structure. L. A. Washington, engineer of that city, has the work in charge.

The Union Metallic Cartridge Co., Bridgeport, Conn., has received bids for the construction of an addition to its plant. The inspection building, which is 50 x 150 feet, will be carried up an additional story and will be arranged for office purposes.

The Globe Foundry Co., Port Chester, N. Y., manufacturer of soil pipe, steam radiators, cast sectional boilers, etc., has begun work on a new branch of the company at Huntington, W. Va. It will employ 200 men at the start, which will be increased to 500 as soon as possible. It is understood that about 200 tons of iron will be melted daily when the plant gets in operation.

The Central Iron & Coal Co., Lebanon, Pa., recently reorganized, is making extensive improvements to its yard. Additional space has been secured, and with an enlarged and up-to-date equipment in the way of trackage, large shears, derricks and other labor saving appliances, the company will have one of the best arranged plants for handling scrap metal in eastern Pennsylvania.

The Merrimack Iron Foundry, Lawrence, Mass., is being greatly enlarged and a big foundry building of brick and steel will be constructed in the near future. Already the work on the foundation of the structure has been begun. The building is to be 100 x 200 feet, and a large ell is to be constructed, 75 x 100 feet. Arthur Gray, of Boston, is the architect, and the builders are Kelley Bros., of Haverhill.

The Monroe Foundry & Furnace Co., Monroe, Mich., has begun active preparation for spending from $10,000 to $15,000 in improvements on its large plant. A new Corliss engine of the roller mill type has been purchased, and a new engine room, to be fitted up in a most up-to-date manner, will be built. A new pattern room, which is to be a model of its kind, will also be constructed. Many other minor improvements will be made, and when completed the plant will be as modern and complete as can possiby be devised.

Extensive additions are to be made immediately to the plant of the American Locomotive Co., Manchester, N. H. The contract, which has been let to the J. H. Mendell Co., of that city, calls first for a new building one story in height, 66 x 77 feet, ground plan, with a center bay 25 feet in width, in which will be installed a five-ton traveling crane. The construction will be of wood and brick. The crane will be operated by electricity to be furnished by the Manchester Traction Light & Power Co. A large amount of new machinery, including lathes, drills, boring mills and special turret machines, designed for steam fire engine work, has been installed.

The Detroit Insulated Wire Co., Detroit, Mich., which was recently incorporated with a capitalization of $100,000, has purchased a site on the Pere Marquette, and will immediately begin the erection of factory buildings. Two acres of ground have been taken by the company which will be almost entirely covered with buildings. The structures will be so placed that the spur tracks from the Pere Marquette will be in the center of the ground, with the buildings on each side. The company is projected

by Mr. Keller, manager of the Westinghouse Electric Co., and Messrs. Hunter and Hartwell are also interested in the project.

The Challingsworth Foundry & Machine Co., Mt. Vernon, O., has just placed an order with the Mt. Vernon Bridge Works, Mt. Vernon, O., for an extension of upwards of 12,000 square feet to its present foundry building, and has recently installed another 20-ton Case traveling crane. Air compressors, etc., are about to be installed. These improvements will make the foundry one of the largest and best equipped jobbing foundries in the state of Ohio.

Jenkins Bros., Ltd., who have been doing business in New York for a quarter of a century, have acquired 120,000 square feet of land in Montreal, and will immediately begin the erection of a brick factory with a frontage of 200 feet, having a depth of 110 feet, two stories high.

The Gadsden Foundry Co., Gadsden, Ala., has contracted to build a modern brass and iron foundry in that city. The main building will be 30 x 100 feet and in addition there will be an engine, pattern and cleaning rooms. All kinds of brass and iron castings will be made.

The Webb City Iron Works, Carthage, Mo., will erect a steel and brick structure to cost approximately $50,000. The building contract was let to Edwards, Sharp & Jones, Harrisonville, for $25,000, which includes all the construction work from foundation up. There will be pattern rooms, machine shops, foundry and office, two air-power traveling cranes with lifting capacity of six and twelve tons, immense air compressors, new engines and boilers.

The Standard Brass Mfg. Co., Cleveland, O., will erect a new foundry building on Central avenue S. E. at the C. & P. railroad crossing. The building will be 20 feet in height and will be 60 x 75 feet. Contract for this building has been awarded to L. A. Griffin.

The Beaver Dam Malleable Iron Co., Beaver Dam, Wis., has under construction and nearly completed three new buildings, annealing building 82 x 300 feet, core building 90 x 300 feet and a sorting building 34 x 106 feet. These will make it the second largest malleable iron plant in the United States, the largest being at Detroit, Mich. The company at present employs 450 men.

Fires and Accidents:—

The plant of the Western Iron Works, St. Paul, Minn., was destroyed by fire, July 26, shortly after the workmen had left the building. The loss is estimated at $40,000, partly covered by insurance.

A $3,000 damage was done by a fire which occurred in the rail mill of the Dominion Iron & Steel Co., Sydney, C. B., on July 24. The building was almost entirely destroyed and there is no insurance.

Fire at the Griffin Wheel Works, St. Paul, Minn., caused a loss estimated at $10,000. The structure, which was of three stories and 40 x 100 feet, was destroyed.

General Industrial Notes:—

The Atlanta Tin Plate & Sheet Mill, Atlanta, Ind., expects to have its plant in operation about Sept. 1. The output will be from 50 to 75 tons per day. The plant will make a specialty of stamping and sheets of special finish, and the company is now open for inquiries. The company succeeded the Atlanta Rolling Mill & Tin Plate Co., which, on account of lack of working capital, had never been able to put its plant in operation. The mill is new and up to date. All machinery, but the rolls, will be electrically driven. There are numerous modern labor-saving devices and the plant is first class in every particular. A supply of sheet bars has been contracted for.

The John Heimer Co., Minneapolis, Minn., is refitting the plant formerly occupied by the White Gasoline Launch Co. The shop is being remodeled, and when the work of installing the machinery is finished, the company will manufacture specialties.

Messrs. Lake, Hale & Co., 11 Front street, San Francisco, Cal., have been appointed exclusive Pacific coast representatives of the Independent Pneumatic Tool Co., of Chicago. They will carry a large stock of Thor piston air drills and reamers, reversible flue rolling, tapping and wood boring machines, pneumatic riveting, chipping, calking and beading hammers, with suitable spare parts.

The Anderson Forge & Machine Co., Detroit, Mich., has completed the installation of its equipment and is now in full operation. Considerable new equipment has been bought, including eight drop hammers, ranging from 1,000 to 2,000 pounds. Drop forgings, steam hammers, forgings and crank shafts are its specialties. Further extensions are contemplated.

The Twentieth Century Brass & Iron Works, Minneapolis, Minn., has just bought out the Acme Brass Works, and has incorporated for $50,000. The new company has rented 7,000 feet of floor space, and work has begun on installing the new machinery for the plating plant and fitting up the foundry which will be finished within a month. The company will manufacture plumbers' supplies, radiator valves, boat trimmings, store fittings and all kinds of brass work. When completed it will have the largest plant of its kind west of Chicago.

The Thomas Iron Works, operated by Roberts, Tatem & Co., and located on the southern branch of the Elizabeth river, Norfolk, Va., has been sold to George Roper, of the John L. Roper Lumber Co., for $30,000, who will put it in operation in the near future.

Trade Notes:—

Contract for the new building to be erected by Wilcox, Crittenden & Co., Middletown, Conn., has been let to the H. Wales Lines Co., of Meriden. The building will be of brick, 100 x 60 feet and four stories. The work will be started at once. It will be used as a machine shop and grinding room.

The Wabash Railroad Co. has expended over $3,000,000 for new cars and engines, and when the orders are filled the company will again be well supplied. Orders now sent in to the factories call for 2,000 freight cars from the American Car & Foundry Co., due in October and November, 30 freight engines from the Baldwin Locomotive Works, of Philadelphia, and 12 switch engines from the American Locomotive Works, Providence.

The Diamond Boiler Works, of Minneapolis, Minn., is building a new plant on Twenty-second avenue and Fifth street. An office building is also being erected at the same place. It expects to have the machinery installed in six weeks and to begin operations within that time.

The largest steel casting ever made in the United States has been turned out at the Falk Mfg. Co.'s plant, Milwaukee, Wis. It is for a turbine for the Allis-Chalmers Co. The single casting weighs 45 tons. This work has attracted the attention of foundry experts all over the country, one being Stranton Griffith, of the Fairbanks Co., of Beloit, the inventor of numerous foundry machines. It has been a great undertaking and has been successfully done.

TRADE PUBLICATIONS.

The Ingersoll-Rand Co., 11 Broadway, New York, has recently published catalog No. 383, describing the Temple-Ingersoll electric-air rock drill. This is an air drill driven by electric power, the compressed air being furnished by an electric-driven compressor mounted on a car alongside the drill.

The Hanna Engineering Works, Chicago, has published the second 1906 edition of its catalog No. 3, describing portable riveters, screen shakers and other labor-saving devices and appliances. The catalog comprises 34 pages, and is printed in two colors on a special grade of tinted paper, and is well illustrated.